Issue 205
PS
1969 Series
THE PREVENTIVE MAINTENANCE MONTHLY
SURE, I CAN USE THE S-M-R CODES... BUT WHAT'LL I USE FOR JUSTIFICATION ?
SUPPLY
See Page 2

SWIRLING, TWIRLING DUST...

IT'S THAT TIME AGAIN

It's that time of the year again. The monsoons have stopped, and mud has turned to dust. Wheels, feet and tracks with a little breeze added, turn that dust into clouds. Then it goes everywhere — on, over, into, through everything.

Which means you've got a PM job, a big one. It's to keep that dirt from your equipment. Dirt will make it fail, damage it or maybe kill it off completely.

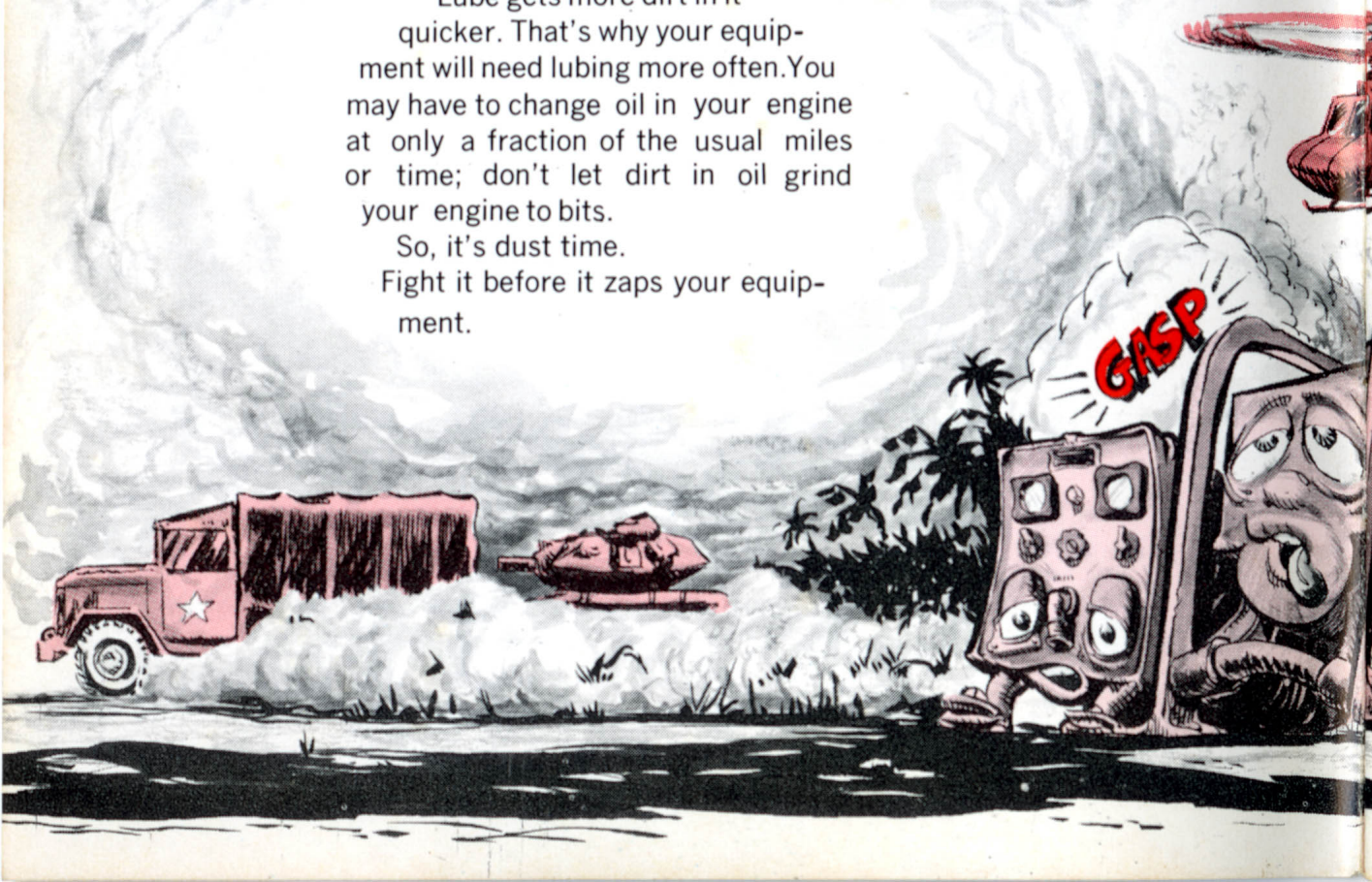
In the dry season you've got to fight dirt all day every day. You protect your gear in whatever way you can. Clean it off, using whatever's right for your equipment. Your tools may range from a tiny rubber blower syringe and delicate lens brush to rags, brooms and shovels. The big thing is — clean it off.

Then, there are filters. You have them on engines and electronic equipment to keep dirt from getting inside. Be sure the filter element is kept clean or changed so it will stop dirt.

Lube gets more dirt in it quicker. That's why your equipment will need lubing more often. You may have to change oil in your engine at only a fraction of the usual miles or time; don't let dirt in oil grind your engine to bits.

So, it's dust time.

Fight it before it zaps your equipment.



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Issue No. 205 1969 Series

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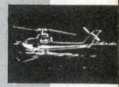

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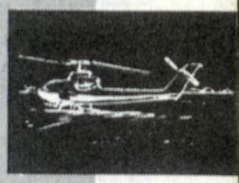

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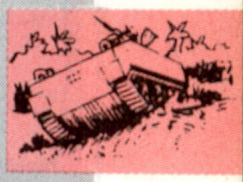

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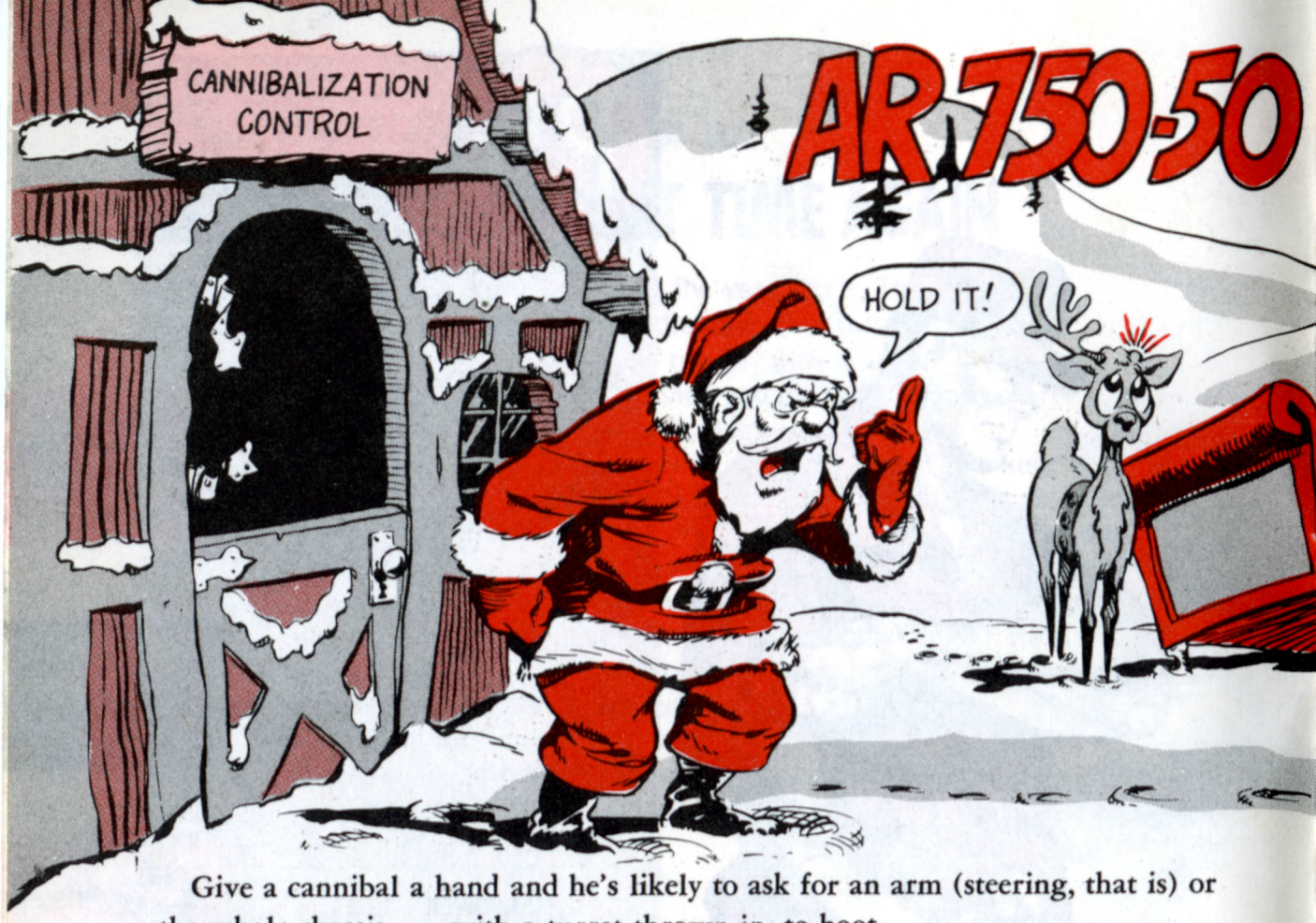


Give a cannibal a hand and he's likely to ask for an arm (steering, that is) or the whole chassis . . . with a turret thrown in, to boot.

This is an obvious display of no couth on the part of that cannibal type and requires your supporting supply activity to appoint a "Couth Control"—or "Controlled Cannibalization"—NCO (CCNCO).

This CCNCO's guide, naturally, is AR 750-50 (Aug 68), which explains the "Use of Controlled Cannibalization As a Source of Repair Parts for Supply Augmentation." (It comes on initial distribution from DA Form 12-9 . . . Maintenance of Supplies and Equipment.)

ARMY REGULATION
No. 750-50

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D.C., *6 August 1968*

MAINTENANCE OF SUPPLIES AND EQUIPMENT

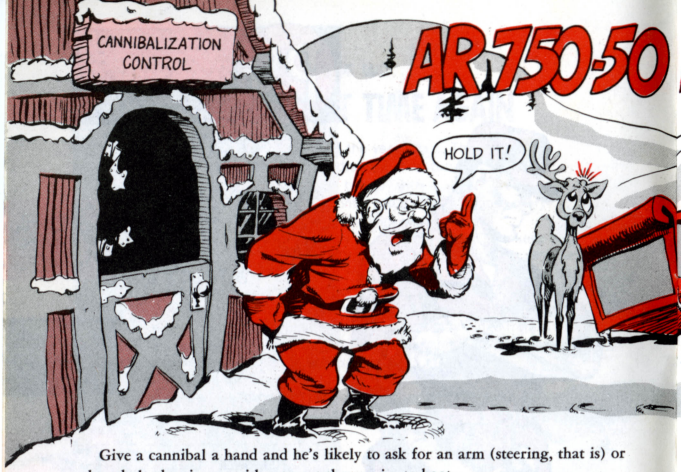
USE OF CONTROLLED CANNIBALIZATION AS A SO
FOR SUPPLY AUGMENTATI

a. Controlled cannibalization. The authorized removal of serviceable parts from one item of equipment in order to install them on another item of equipment.

Since some cannibals need more control than others, this AR tells it like it is. It comes on real strong in para 5. That's the one which authorizes your command to set up a cannibalization point as a control station for this business of switching a serviceable part from one piece of equipment to repair another of the same kind. Otherwise, it can get out of hand.

d. Cannibalization point. A collection and disassembly area where disposable items are collected, classified, and held for recovery of repair parts for return to the supply system.

AR 750-50 FOR EVERYONE



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It's a good deal because a "can" point in your own area gives you a new source of supply for 3 . . . count 'em . . . unusual kinds of repair parts:

1. Components not stocked in the supply system because they normally last as long as the end item itself.

2. Parts from older makes and models of equipment that the Army doesn't buy any more . . . like "obsolete."

3. Items for equipment that's supposed to be repaired with cannibalized parts according to Army policy . . . such as the M715 5/4-ton truck.

PS MORE

FOR EVERYONE

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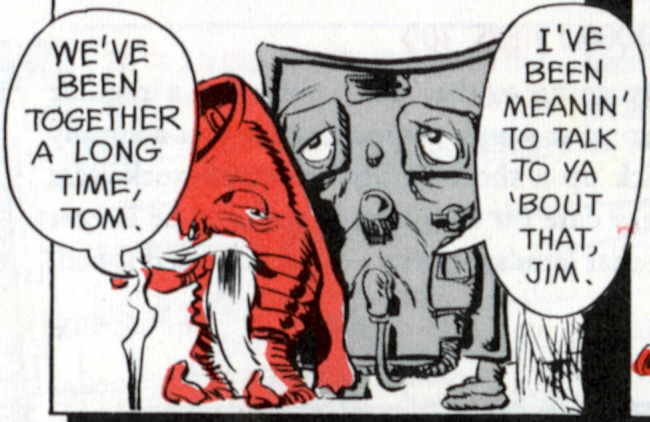

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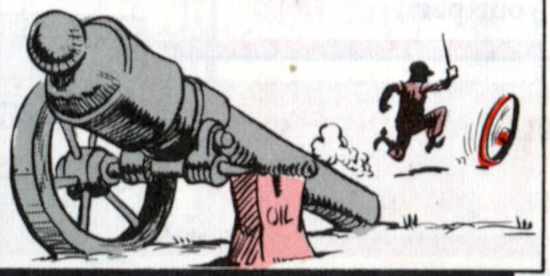

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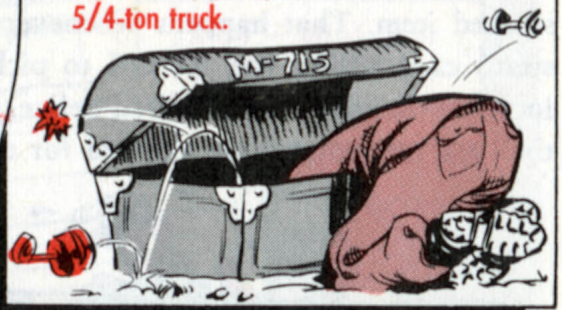
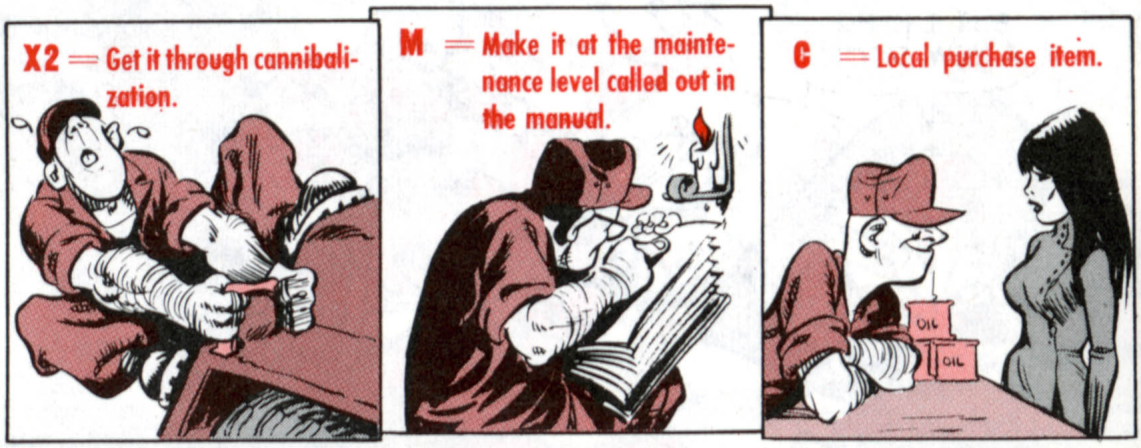


P.S. MORE

CHECK THE CODE

If you're not sure which repair parts should be supplied to you from your nearest "can" point, remember 2 things.

First, these are fringe items which are not stocked by the Army. Second, you can identify them in the equipment "P" manuals by a **Source** code such as:

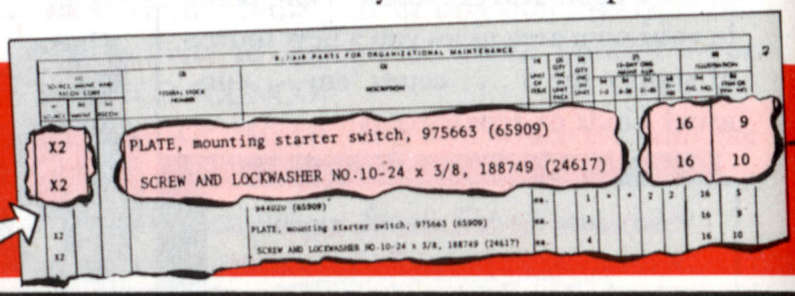


HOW DO YOU ORDER ONE?

Cannibalized parts are asked for on the same DA Form 2765 (Request for Issue or Turn-in) used for a normal supply request . . . with a difference, of course. The difference is that your supply support wants you to include enough description for the "can" point type to understand exactly which part you want.

After all, they're the ones who have to hit the boneyard on a recon patrol for your part.

YOU USE THE INFO HERE TO FILL OUT DA FORM 2765 . . . SO YOUR SUPPLY SUPPORT PEOPLE WILL KNOW WHAT PART YOU WANT.



WORKS FOR STOCKED ITEMS, TOO

Every now and then you can justify going to the "can" point for a regular stocked item. That happens whenever your supply support sends you a supply status card telling you it's OK to pick up a short-supply or out-of-stock item locally—or that your required delivery date for that item is going to be longer than the maximum time allowed for that item's Priority—and you need it bad.

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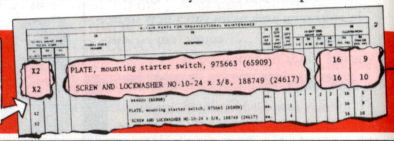

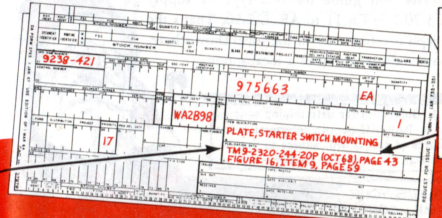

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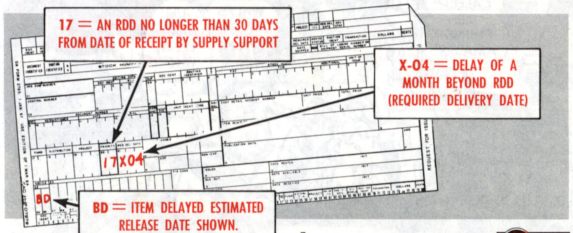

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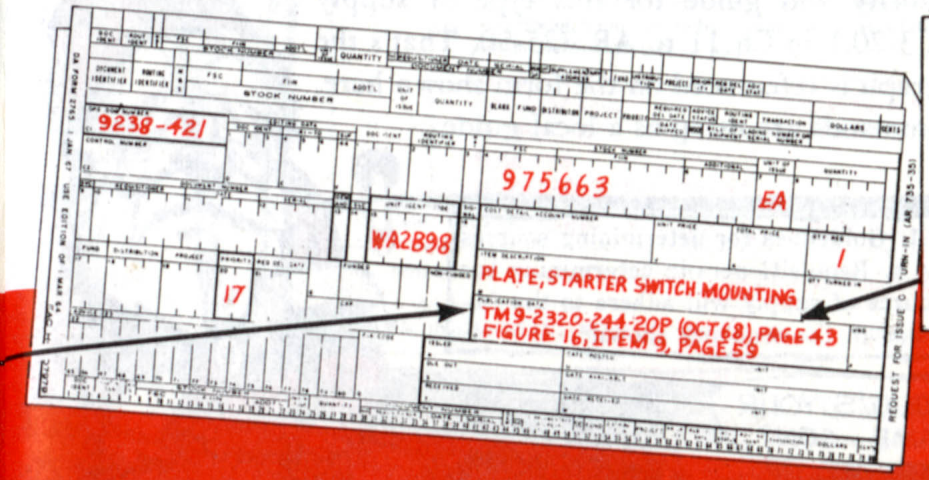

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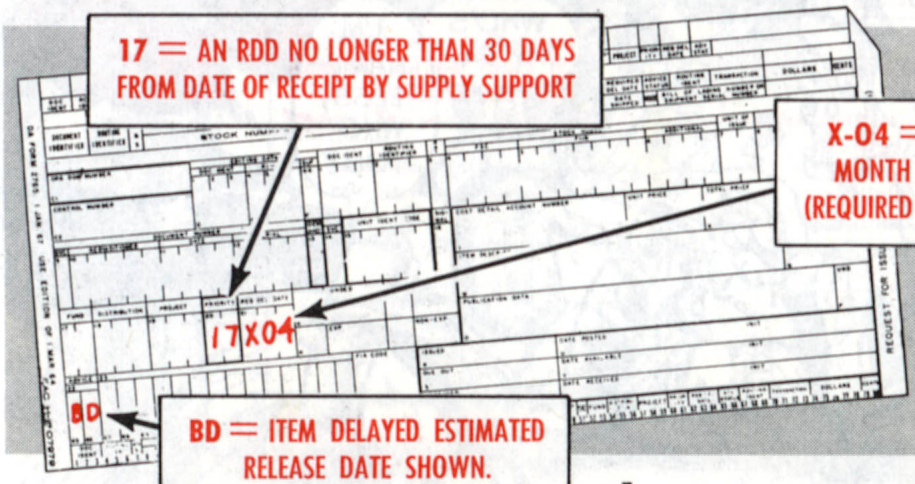

PS END

JUSTIFY YOUR NON-STOCK PARTS — OR . . .

GO-GO FORM FOR NO-NO SUPPLY

A worn out part without an FSN or maybe any number is like an R & R returnee who's lost his ID card. Both will need a little extra effort to explain what they really are — and where they belong.

Let that GI do his own worrying, and let's concentrate on that helpless part that can't do for itself. That part needs something like this suggested form to help your supporting supply unit find a replacement.

Support's authority and guide for this type of supply operation is para 3-20.1 in Ch 11 to AR 725-50. That's the reason this paragraph is referenced on the form shown here, which a lot of commands are using as a local guide.

★ 3-20.1. Guidelines for determining sources of supply. *a.* Requisitioners in determining the proper source of supply will adhere to the following steps in the sequence shown:

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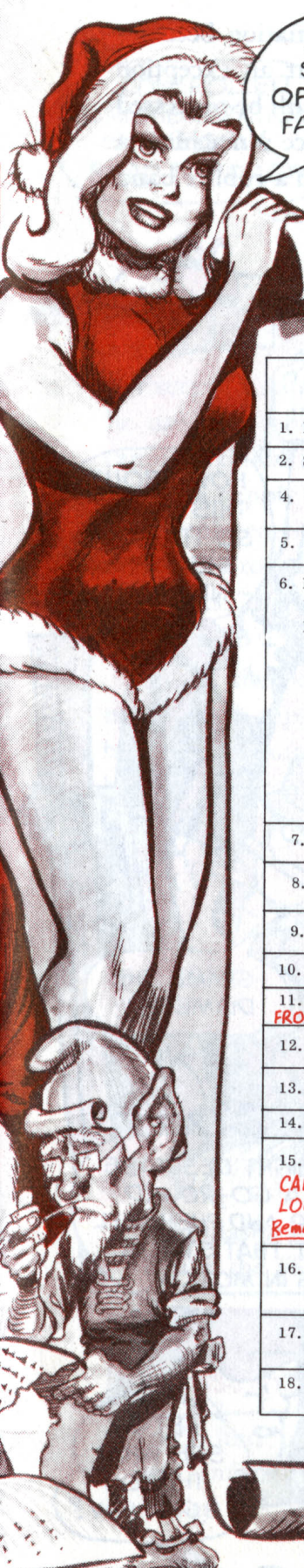
JUSTIFICATION FOR NON-STANDARD ITEM

Ref: AR 725-50 par 3-20.1

1. Nomenclature of Requested Item: SPRING SEAT, FRONT SUSPENSION
2. Stock or Part No. (Mfr No.) # 7409342 — 3. Unit Request No. 9241-034
4. Manufacturer (Name, Address and/or Federal Supply Code): KAISER JEEP CORPORATION 65909
5. Publication: TM 9-2320-211-20P — Date: MAR 63 — Page No. 124
6. End Item Data
   a. Stock or Part No. 2510-055-9261 — b. Line Item No. 330120 — c. Model No. M52A2 — d. Serial No. 9524-12753
   e. Contract No. DA-20-113-AMC-06727(T) — f. Frame, Chassis or Data Plate No. NA
   g. Description (continue on back--include nomenclature, sketch, dimensions, physical characteristics, etc.): SEAT - ITEM 17 # PN 7409342 FIGURE 11B PAGE 178 TM 9-2320-211-35P May 64 — CAST STEEL 5-TON TRUCK TRACTOR
7. Using Activity: 85th MED TRK CO, 96th TRANS GP
8. Maintenance Category Authorized: ORGANIZATIONAL
9. End Item be DEADLINED? yes ✓ no ___ If yes, date 9240
10. Reason for replacement: CRACKED
11. Next higher assy: a. Stock No. FRONT SUSPENSION 2510-740-9345 — b. Cost $22.09 — c. Description SPRING ASSY, LEAF
12. Estimated replacement cost: UNK — a. Item UNK — b. Manhours $15
13. Requirement still valid up to 360 days? yes ✓ no ___
14. Reclamation, fabrication or local purchase attempted? yes ✓ no ___
15. Reasons these methods were not successful: CANNIBALIZATION POINT DOES NOT HAVE ITEM. FABRICATION AND LOCAL PURCHASE NOT AVAILABLE. Remarks: This unit has the qualified personnel and facilities to install this item. — J. JONES MAINT OFFICER
16. Anticipated replacement rate for requested part — a. End items on hand 61 — b. Parts quantity 2 EA. — c. Replacement period (Months) UNK
17. DA Form 2028 submitted? yes ___ no ✓ If not, why? LOW MORTALITY
18. Additional Missile & Rocket Item Data — System ___ — Serial No. ___

PS MORE



ANY INFO YOU CAN OFFER ABOUT AN ITEM HELPS YOUR SUPPLY SUPPORT PEOPLE AND IMPROVES THEIR CHANCE OF SATISFYING YOUR SUPPLY DEMANDS... BY CANNIBALIZATION, FABRICATION ...OR LOCAL PURCHASE. HERE'S A FORM THAT WILL HELP YOU.

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e. Contract No. DA-20-113-AMC-06727(T)

f. Frame, Chassis or Data Plate No. NA

g. Description (continue on back--include nomenclature, sketch, dimensions, physical characteristics, etc.)
SEAT - ITEM 17 CAST STEEL
PN 7409342 5-TON TRUCK
FIGURE 11B TRACTOR
PAGE 178
TM 9-2320-211-35P May 64

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FRONT SUSPENSION	2510-740-9345	$22.09	SPRING ASSY, LEAF

12. Estimated replacement cost: UNK a. Item UNK b. Manhours $15

13. Requirement still valid up to 360 days? yes ✓ no ___

14. Reclamation, fabrication or local purchase attempted? yes ✓ no ___

15. Reasons these methods were not successful
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Remarks: This unit has the qualified personnel and facilities to install this item.
J. Jones MOTOR OFFICER

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	61	2 EA.	UNK

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PS MORE

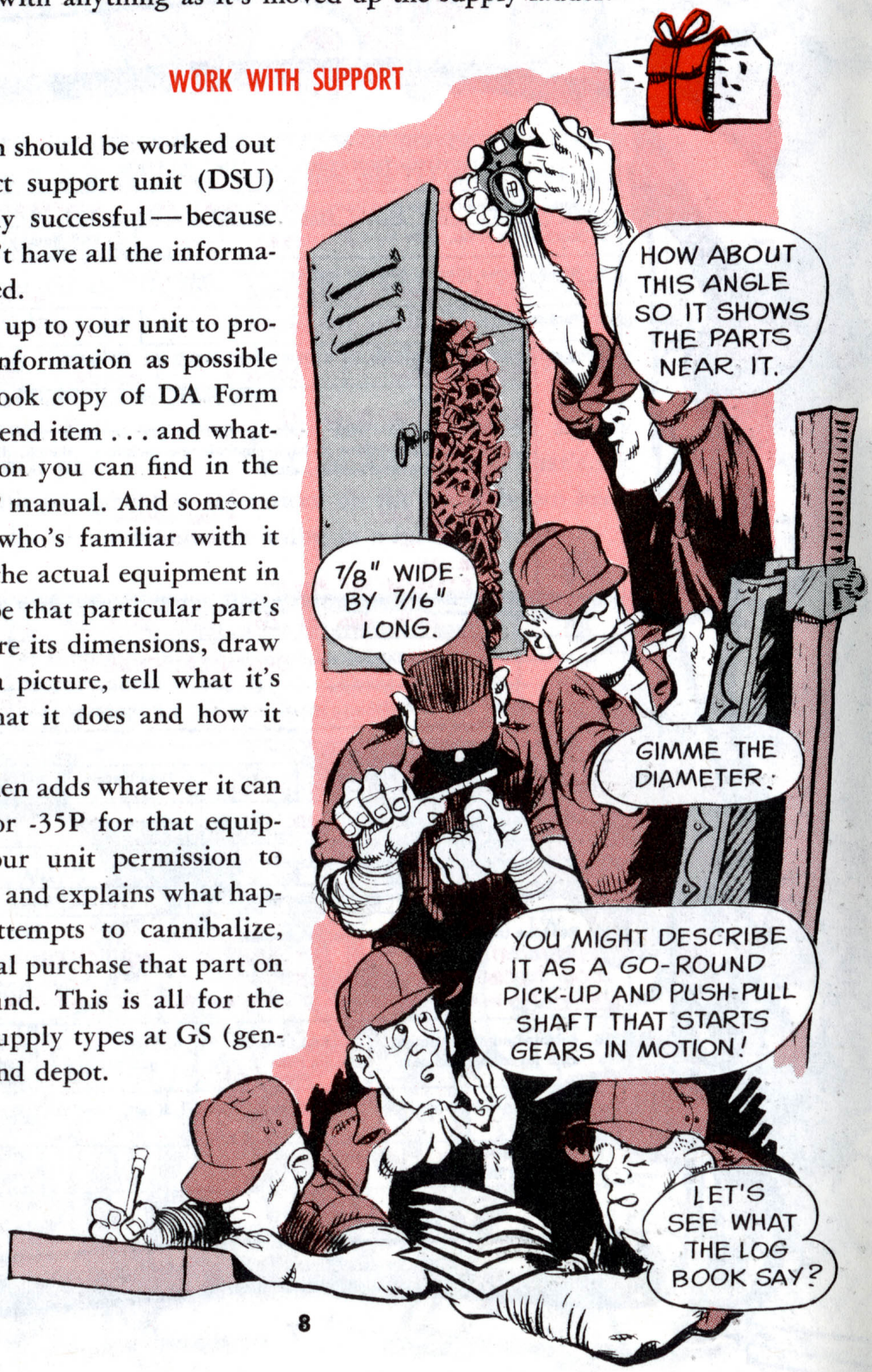
If none of these local supply sources work, this same information becomes even more valuable. Support will then use it to help make out an exception data type of requisition. This means that supply transaction card will be processed by hand instead of by machine. And, since it doesn't have to face a machine, a justification statement wrapped around the requisition card with a rubber band won't interfere with anything as it's moved up the supply ladder.

WORK WITH SUPPORT

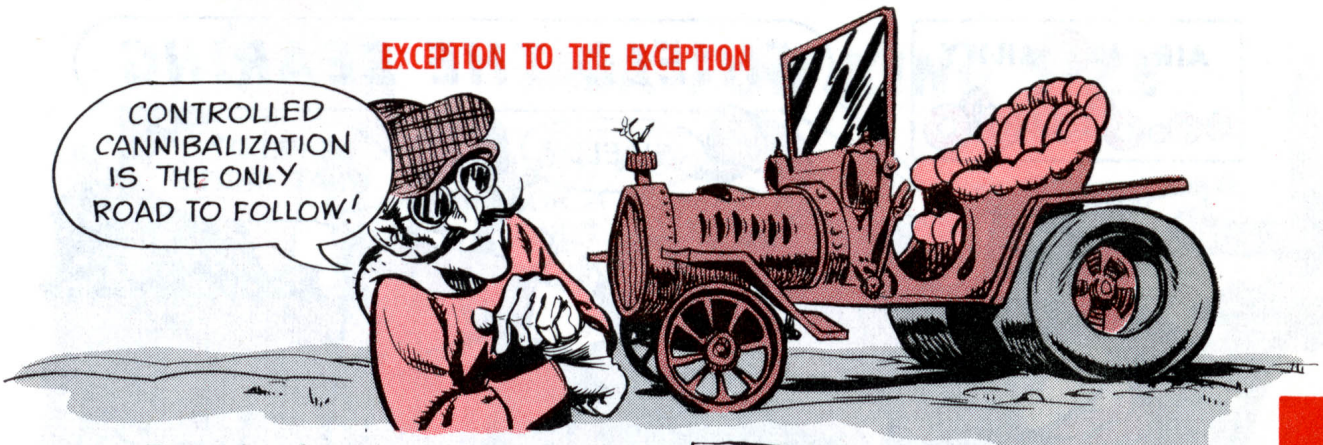
This approach should be worked out with your direct support unit (DSU) to be completely successful—because your unit doesn't have all the information that's needed.

However, it's up to your unit to provide as much information as possible from the log book copy of DA Form 2408-7 for that end item . . . and whatever identification you can find in the equipment -20P manual. And someone in your outfit who's familiar with it should eyeball the actual equipment in order to describe that particular part's location, measure its dimensions, draw a sketch, take a picture, tell what it's made from, what it does and how it operates.

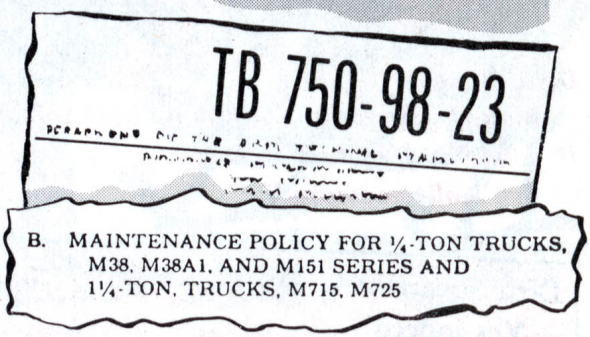
Your DSU then adds whatever it can from its -34P or -35P for that equipment, gives your unit permission to install that part and explains what happened to its attempts to cannibalize, fabricate or local purchase that part on the first go-round. This is all for the benefit of the supply types at GS (general support) and depot.



EXCEPTION TO THE EXCEPTION



Exception data requisitions can never be used on some vehicles. Controlled cannibalization is the only road to follow as a supply source for non-supply parts replacement on the M38, M38A1, M151 1/4-ton and M715, M725 5/4-ton trucks. That's spelled out by Appendix B to TB 750-98-23 (Dec 68).

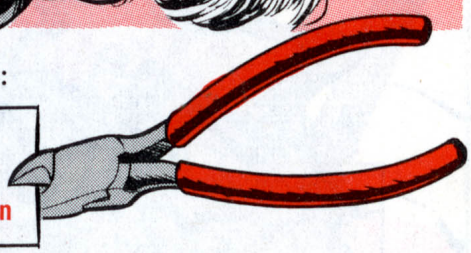


This is the best route for quick action on an item normally considered a no-no in the supply system because it's not stocked, has no FSN or Part Number, has a long equipment life, is hard to identify, doesn't belong to a higher assembly . . . or a combination of the above. So it has to be handled in a special way if you really want it.

GET A GRIP ON IT

Need plastic grips for your pliers? Here're the FSN's for the different size grips:

5340-753-3592, 3-in length for 4-in to 6-in handles
5340-753-3593, 4-in length for 6-in to 8-in handles
5340-753-3594, 5-in length for pliers with handles over 8-in

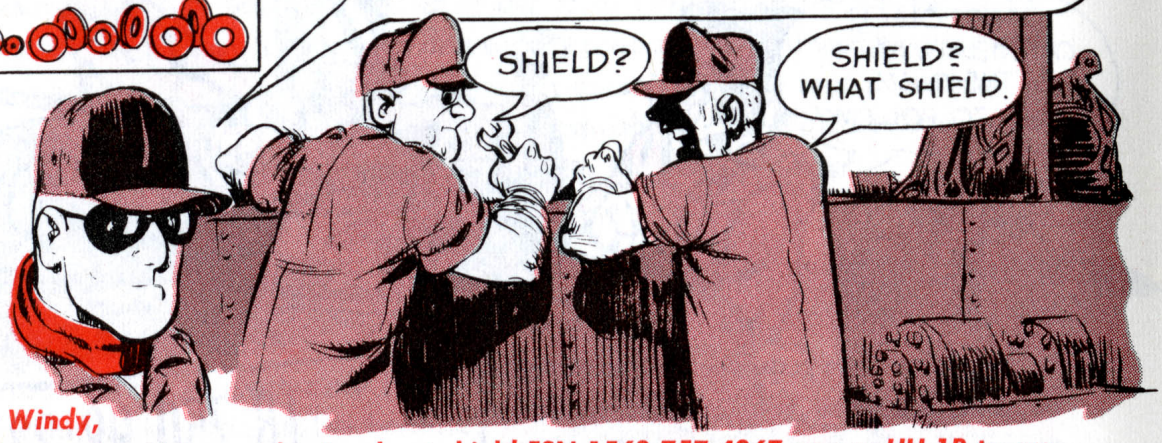


You'll find 'em listed in Fed Cat C5340-IL-A-CB6 (Aug 69).

Just remember — these grips are no substitute for good safety practices around electricity.

AIR MOBILITY

SHIELD THE BEARING



Dear Windy,

We got gigged for not having heat shield FSN 1560-757-4867 on our UH-1B to protect the No. 1 hanger bearing.

Is it really necessary?

SP6 C. W. W.

Dear Specialist C. W. W.,

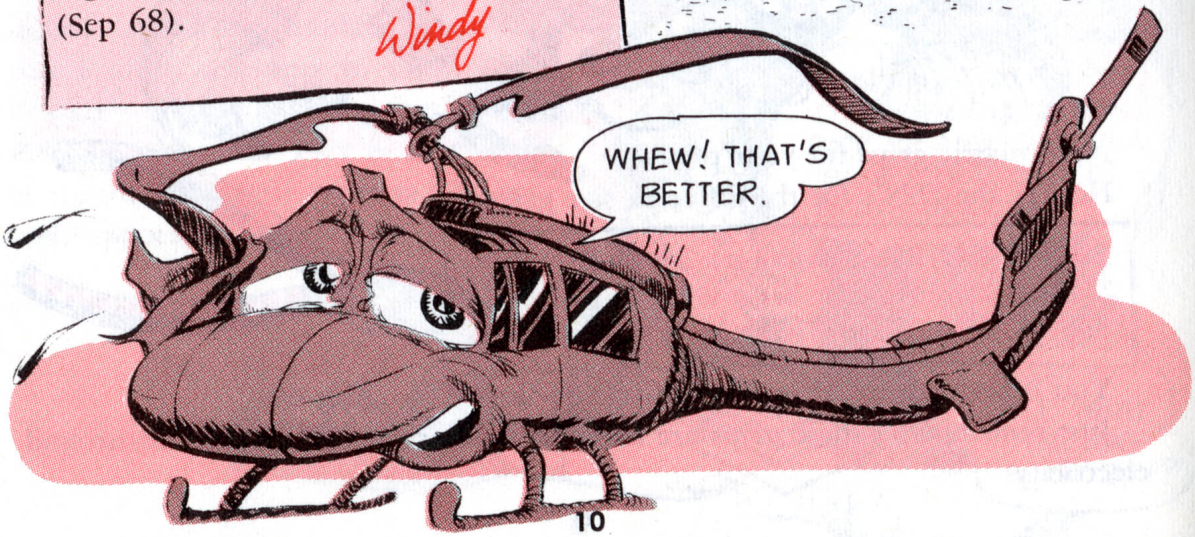
Yes indeed!

The shield protects the bearing from engine heat. Without it the bearing would be damaged because the grease won't hold up under increased temperatures.

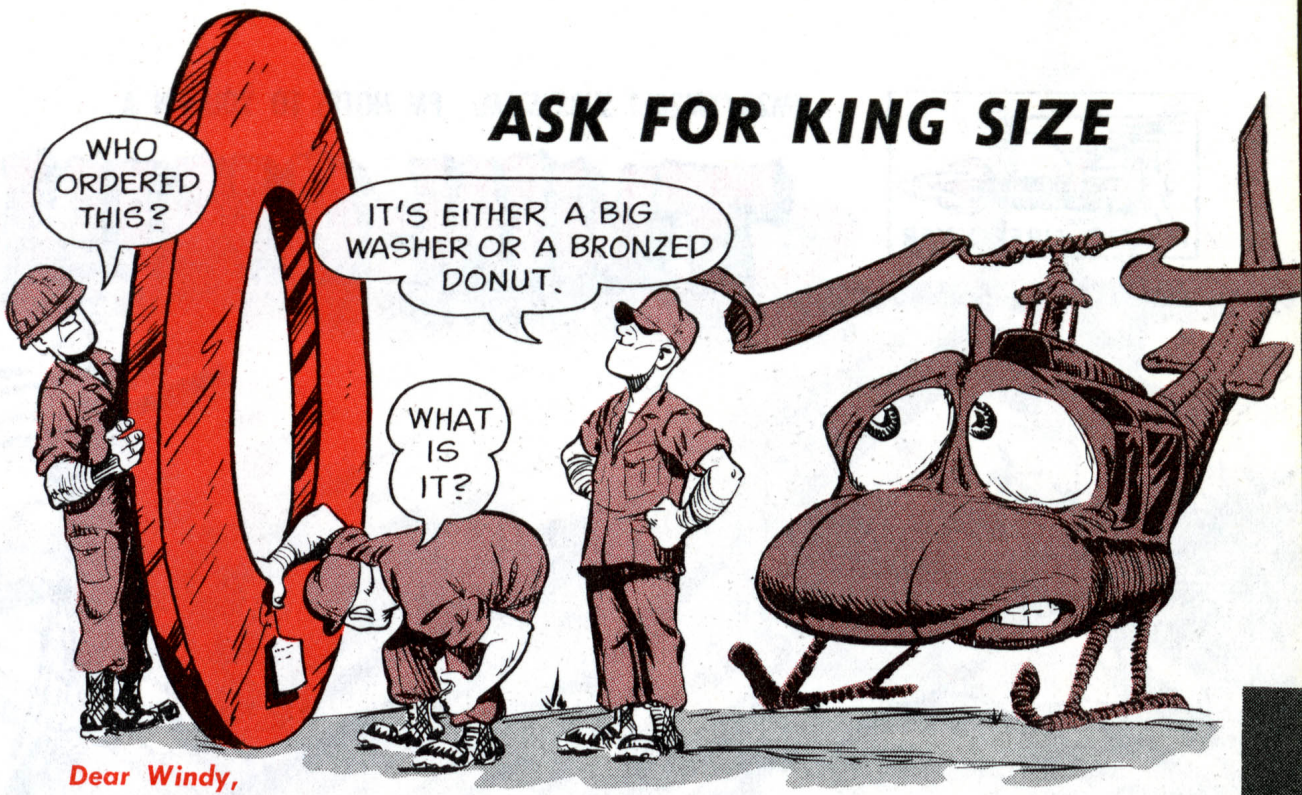
The shield goes on B Model, S/N 64-13902 thru S/N 64-14100 and on C Model, S/N 64-14101 thru 66-15245.

Check with support and you'll find the shield is attached to the fireshield with the 8 bolts and washers listed in Fig 112 of TM 55-1520-210-35P-2 (Sep 68).

Windy



ASK FOR KING SIZE



Dear Windy,

What do you think about using a larger washer on the Huey (UH-1D) connecting tube between the stabilizer bar and damper?

As I see it, the washer under the head of the attaching bolts is too small. A loose tube and bearing could ride over the washer and bolt—control of the bird would be lost.

Any suggestions?

MAJ J. H. P.

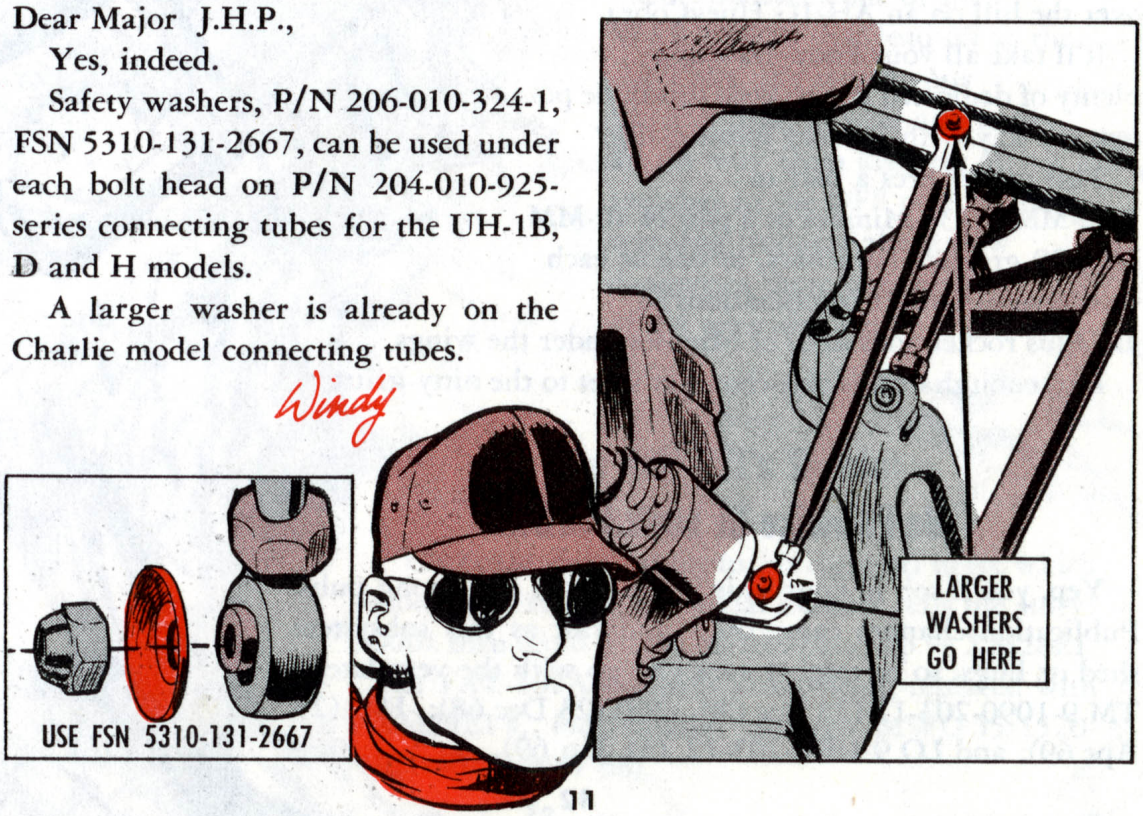
Dear Major J.H.P.,

Yes, indeed.

Safety washers, P/N 206-010-324-1, FSN 5310-131-2667, can be used under each bolt head on P/N 204-010-925-series connecting tubes for the UH-1B, D and H models.

A larger washer is already on the Charlie model connecting tubes.

Windy



XM28/XM28E1 SUBSYSTEM: PM NOTES TO YOU ON A...

TWIN-CHIN

Make no mistake, you 45J's, this quick-switch XM28/XM28E1 is the most complicated yet to heave over the hill on an AH-1G HueyCobra.

It'll take all your know-how and plenty of dedicated PM to keep this dude potent, so stay with it every minute, dig?

This critter fires a pair of 7.62-MM M134 Minnies or a pair of 40-MM XM129 grenade launchers, or one of each —4 possible turret combinations in all. Plus rocket pods and/or Minnies under the wings.

But, enough of this chit-chat. Let's get to the nitty-gritty.

Be Pubwise Or Look Foolish

Yep, you'll sob in your suds if you get in the wrong pubs. Publication changes came thick and fast as this subsystem shed its bugs, so be mighty sure you go with the very latest: TM 9-1090-203-12 (28 Dec 68), -20P (23 Dec 68); -ESC (25 Apr 69); and LO 9-1090-203-12 (31 Jan 69).

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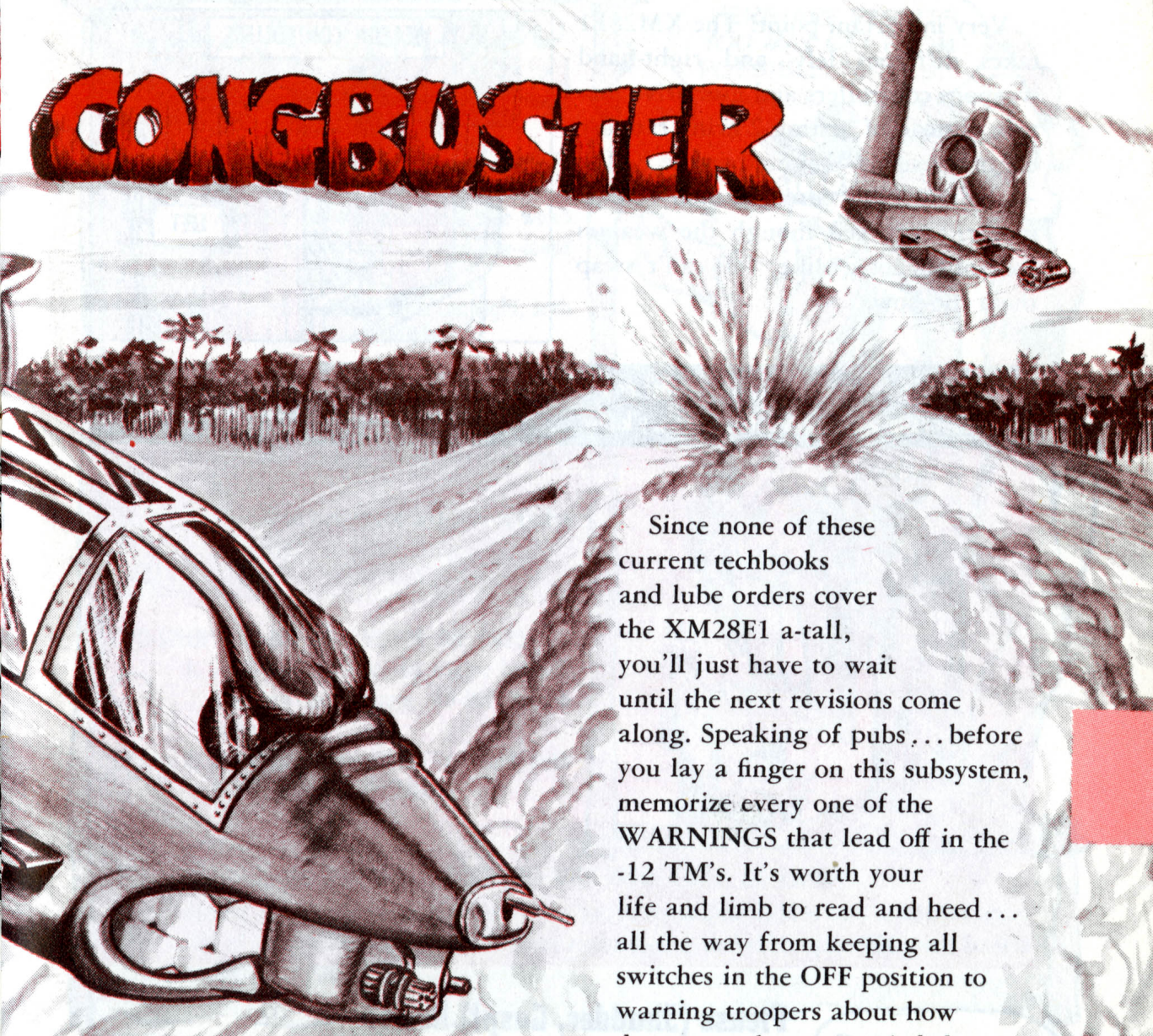
Since none of these current techbooks and lube orders cover the XM28E1 a-tall, you'll just have to wait until the next revisions come along. Speaking of pubs... before you lay a finger on this subsystem, memorize every one of the WARNINGS that lead off in the -12 TM's. It's worth your life and limb to read and heed... all the way from keeping all switches in the OFF position to warning troopers about how dangerous those unexploded M384 grenades are.

The XM28E1's Special

Check the decal on the turret right off to see which model you've got. The serial number tells the story: 0001 thru 0396 = XM28; 0397 and up = XM28E1. The TAT-102A's (XM64's) are being replaced with XM28E1's, incidentally, through MWO 55-1520-221-40/2 (Nov 68).

PS MORE

CONGBUSTER



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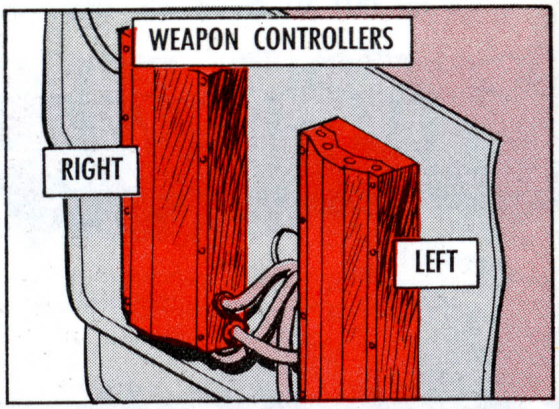
P.S MORE

Very important point! The XM28E1 takes different left- and right-hand weapons controllers and gun drive motors. Instead of getting 2 firing rates by use of a resistor — as used on the XM28 — the XM28E1 uses a dual-voltage motor. So, even though the weapon controllers look alike, you can't swap them no-how.



TIP: Some units stencil the model and serial numbers on both the turret and controllers to prevent slip-up. Stencils outlast decals, y'know.

Here's a li'l chart to help you keep em straight:

System & Serial No.

XM28 (0001 thru 0396)	XM28E1 (0397 and up)
Weapons Controllers	Weapons Controllers
LH 11688509 (FSN 1090-078-2735)	LH 11690242 (FSN 1090-127-2985)
RH 11688510 (FSN 1090-078-2739)	RH 11690243 (FSN 1090-127-2986)
Machine Gun Drive	Machine Gun Drive
LH 11690060 (FSN 1005-828-2884)	LH 11690280 (FSN 1005-127-2993)
RH 11690061 (FSN 1005-827-0334)	RH 11690270 (FSN 1005-127-2984)

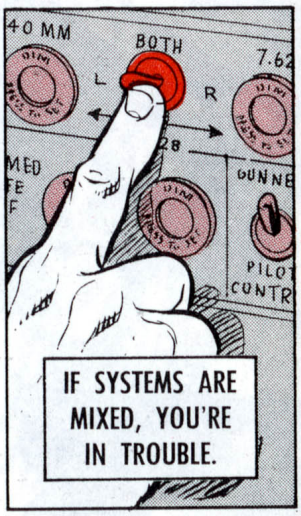
A quick way of distinguishing XM28 from XM28E1 weapons controllers is the dash number after the Mfg Part No.

XM28	XM28E1
LH 717440-305	LH 717440-309
RH 717440-307	RH 717440-311

Please (Shudder, Gasp!) Don't!

Can't stress enough that you should **NEVER** put the XM28 speed controllers and/or machine gun drives on the XM28E1, or vice versa. Just remember what could happen:

If the pilot or gunner should put his weapon select switch on BOTH, the Minnie and the 40-MM could both fire at the same time . . . and a bullet could explode a grenade right in front of the Cobra, so he'd literally shoot himself down! Ugh!



WARNING

OLD SPEED BOX ON XM28E1 —

OLD

1. 40-MM on old speed box side operates normally.
2. 7.62-MM on old speed box side won't fire by trigger but operates low-speed from 40-MM thumb button.
3. In switch position "both" on sight, both fire together — WHAMMO!

NEW SPEED BOX ON XM28 —

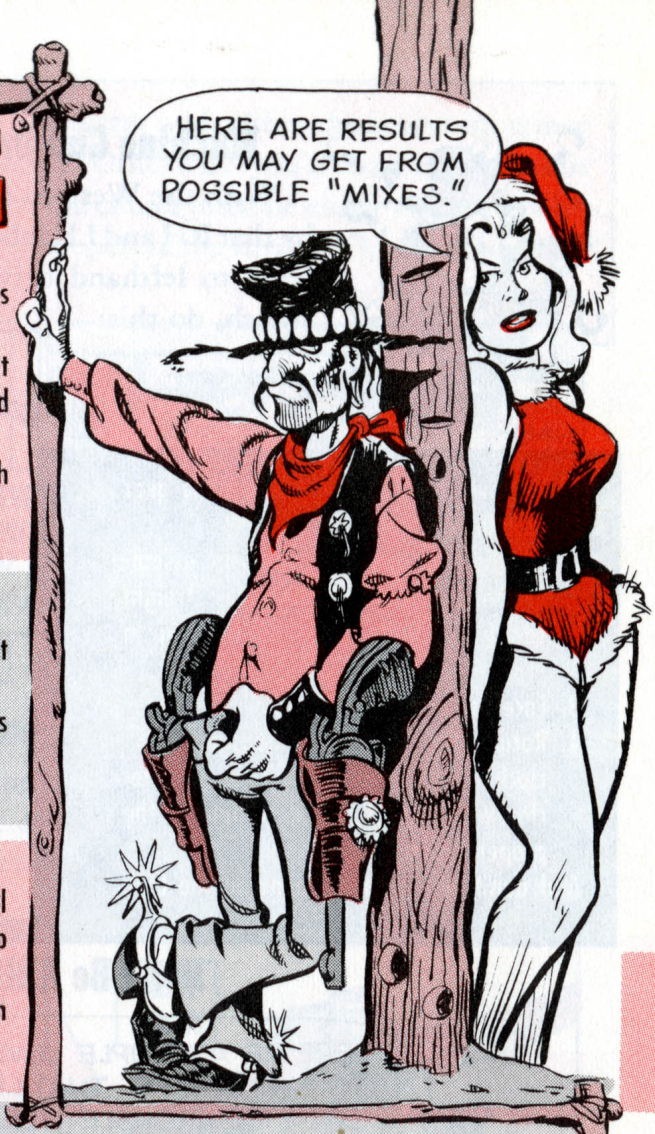
NEW

1. 7.62-MM on new speed box side can't be fired.
2. 40-MM on new speed box side operates normally.

TWO-SPEED 7.62-MM GUN MOTOR ON XM28 —

2 SPEED

1. 7.62-MM won't fire by trigger but will fire low-speed from 40-MM thumb button.
2. In switch position "both" on sight, both fire together — WHAMMO!



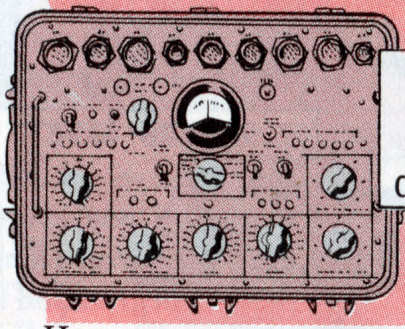
SINGLE-SPEED 7.62-MM GUN MOTOR (INSTALLED WITH PATCH CABLE) ON XM28E1 —

1 SPEED

Applies 28 volts (from turret armed-power bus) to motor shunt field at pin 9 of A3A1P1. Other side of shunt field (tied to ground) draws excess current, and either opens VDC circuit breaker or damages system.

Other pointers on these controllers:

Test the XM28's controllers with your organizational test set (FSN 4933-855-5828) by following the scoop in para 3-32 of your -12 TM. BUT don't use this test set on the XM28E1's controllers till you hear otherwise or you'll hurt the controllers. In fact, don't test the XM28E1 controllers at all. If they don't work right, replace 'em (by DX) pronto. Repair parts are authorized for 'em at support.



However, you can test everything else electrical on both the XM28 and the XM28E1 with this set, except the controllers.

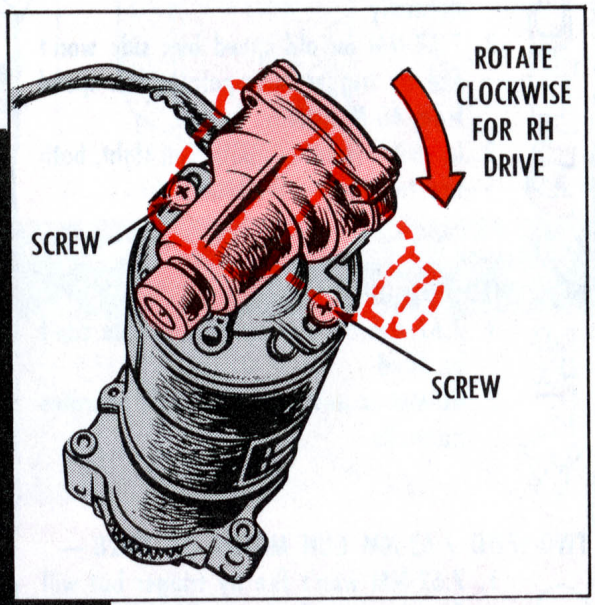
PS MORE

Machine Gun Drive Gimmick

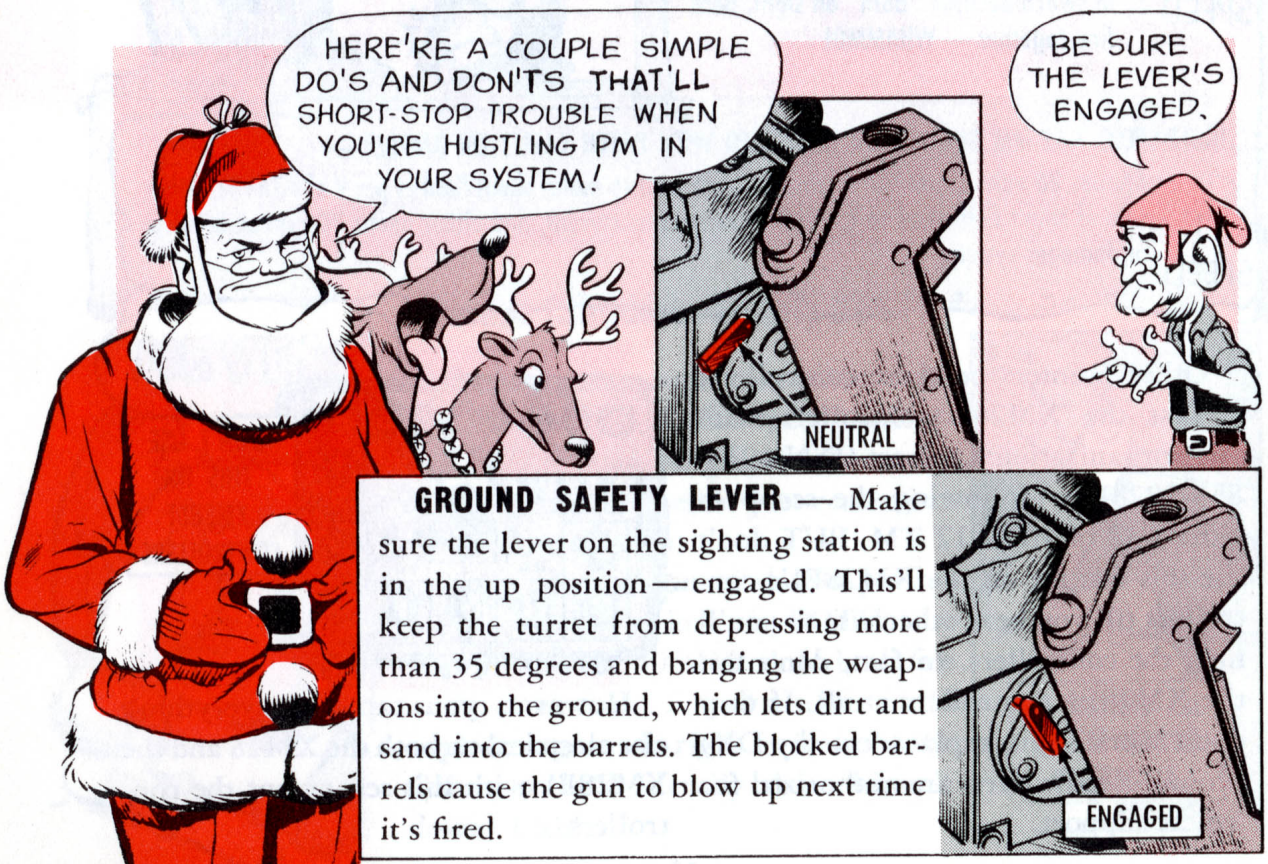
With the Western Gear motor you don't have to be stuck by that RH and LH label. You 45J20's can convert from right-hand to lefthand drive—or vice versa—easy. To make a switch, do this:

1. Remove the 2 screws holding the gear box to the motor.
2. Lift the gear box away from the assembly to disengage the headless straight (doll) pin that holds the housing in proper position.
3. Face the ammo drive end.
4. Rotate the gear box housing 105° clockwise (for RH drive) or counter clockwise (for LH drive) and line up the proper holes.

And don't worry about changing the FSN.

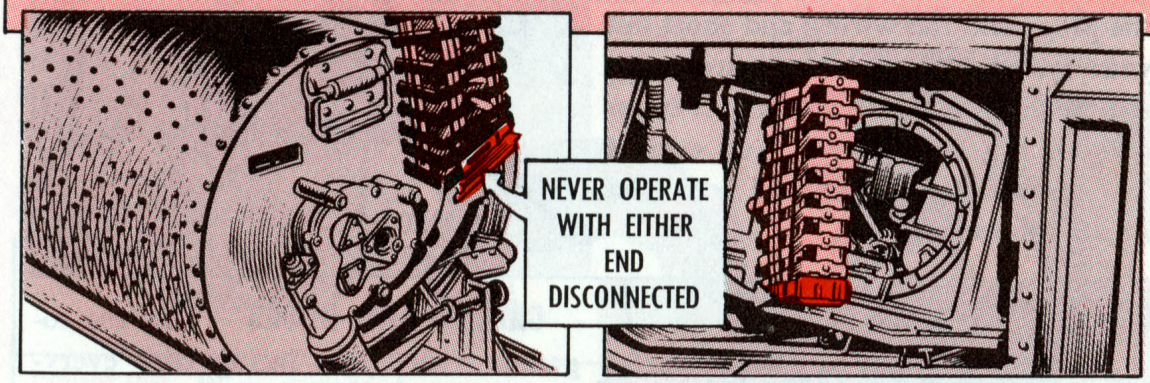


Don't Be A Hex-Maker



GROUND SAFETY LEVER — Make sure the lever on the sighting station is in the up position—engaged. This'll keep the turret from depressing more than 35 degrees and banging the weapons into the ground, which lets dirt and sand into the barrels. The blocked barrels cause the gun to blow up next time it's fired.

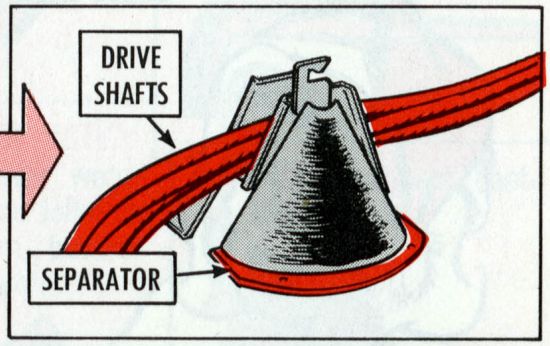
TURRET CHUTING—Never operate the turret with either the ammo container or the gun end of the chuting disconnected. Otherwise you'll tear up the limit switches, chuting and wiring. Remember, the chutes must be either completely installed or completely removed before you operate the turret! This goes for both Minnies and grenade launchers, too.

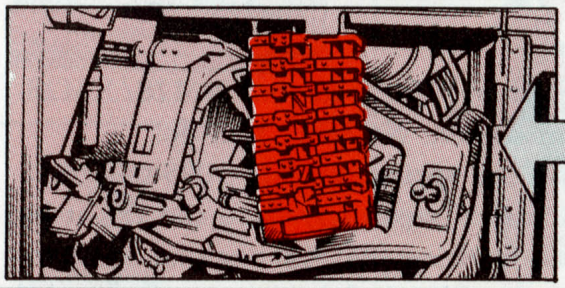


Installation/Removal Reminders

Pretty tricky business installing Minnies and grenade launchers and all their stuff on this system, what with all the combinations possible. Notch these cues in your noggin and you'll come out ahead:

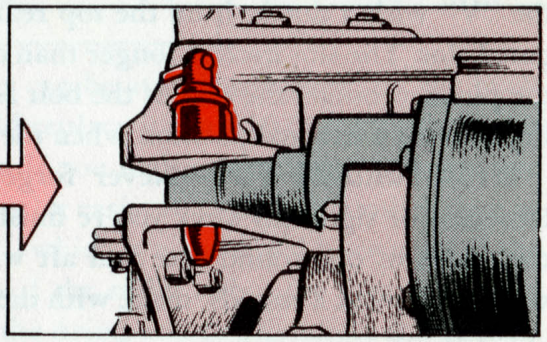
AMMO DRIVE SHAFTS — Run 'em through the chute separator—but make sure there's enough slack on the turret side to keep the shaft from being stretched and cut when the turret moves. Keep a balance between turret and ammo bay. Too much slack can foul and get cut.





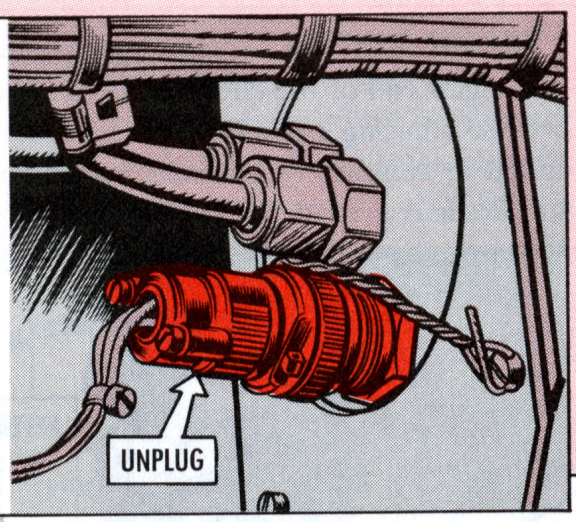
AMMO CHUTES—All 7.62-MM and 40-MM chutes in the turret must have their open sides facing up or out—never down or in—at attachment points.

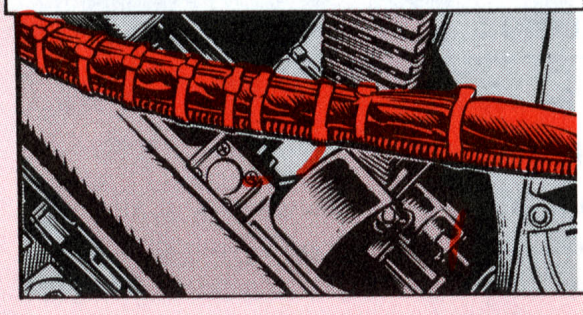
QUICK-RELEASE PINS—Make sure you get the right-size pins in the right places and installed the right way. F'rinstance, the release pin that holds the front end of the delinking feeder to the gun must always be heads up.



PS MORE

AMMO COMPARTMENTS — Never forget to unplug **both** electrical connectors on the rear of the containers before you slide the 7.62- and/or 40-MM ammo containers out or you'll damage the plugs and the wiring and short out your system. Watch these wires after they're unplugged, too. Don't set boxes or your big feet on 'em. And eyeball 'em constantly for cuts and bent pins in the connectors.





CABLES AND HOSES—Tie 'em together with nylon lacing cord everywhere you can to keep 'em out of trouble. And make sure the 40-MM flex drive shaft is held by nylon webbing provided for this purpose.

More M134 Mini-Facts

Be cotton-pickin' sure you've got firing pin 65F10057 in your XM28/XM28-E1's M134 Gun or you're setting up a jam session. No other will do!

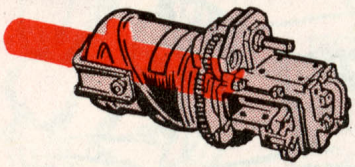
This pin's a component of parts kit, pin and spring set FSN 1005-052-9558 (P/N 5910873). The pin's not stocked or issued separately. You can tell it by the "V" with a dot in it on the top rear of the firing pin, right behind the elongated slot. The slot itself is longer than on other Minnie firing pins so the tang of the pin can contact the rear of the bolt assembly. This keeps the pin from vibrating into the extracted position when the 40-MIKE-MIKE's being fired.

M134 LOADING TIP—Never forget to doublecheck the loaded chute for looseness or tightness after you're finished loading. If you can't budge the ammo the width of one round fore and aft with your finger, or if you can move it the width of almost 2 rounds, make with the fixes in para 2-18b(10)(a) and (b) of your -12 TM.

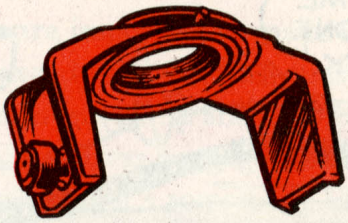
XM129 Grenade Launcher

Here're some of the main trouble spots to look for when you strip it for cleaning and lubing:

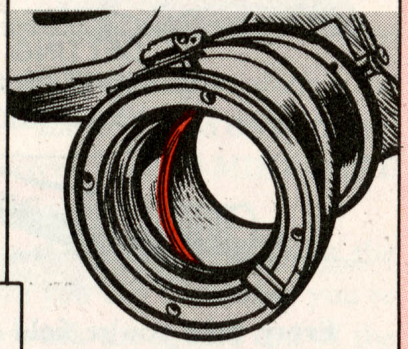
TUBE ASSEMBLY — Barrel bulged, deformed; bore eroded, badly pitted; lands worn, damaged.



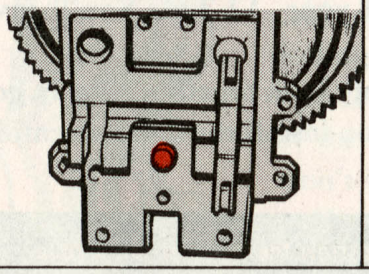
FRONT SUPPORT ASSEMBLY — Rollers won't turn; retaining rings loose.



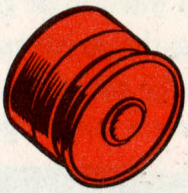
DRUM ASSEMBLY — Internal cam paths badly worn.



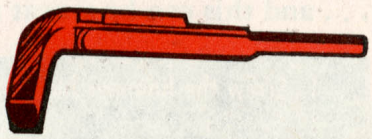
FIRING PIN—Worn, damaged.



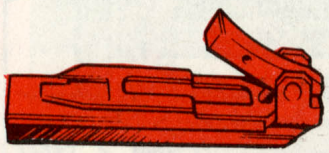
BREECH INSERT — Eroded.



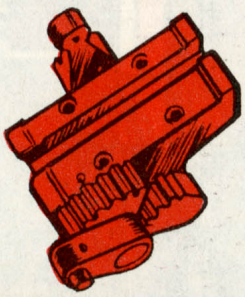
FIRING PIN STRIKER — Tip badly burred.



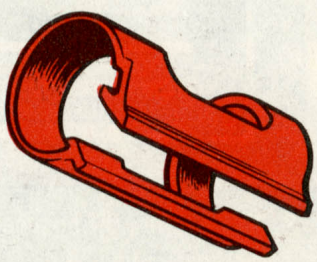
FEED SLIDE ASSEMBLY — Grooved pin missing; slide badly burred.

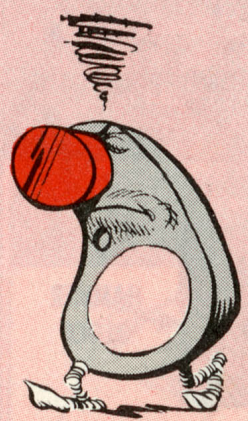


CARTRIDGE FEED ACTUATOR — Feed lever worn, cracked; feed and follower gear teeth worn, busted; feed arm roller worn.



YOKE GUIDE — Bent, dented, twisted.





That feed arm roller can be a trouble-maker. By the book (Table 3-4), you should replace it after 10,000 rounds, but it could wear before that. If you find it flatsided, put a new one in pronto. For sure, it's a lot easier to replace this roller than to replace the feed cam . . . which is what you'd have to do if the roller gets shot. 'Cause if the roller's shot the cam will wear away and slow down the firing and finally affect the timing.

P.S MORE

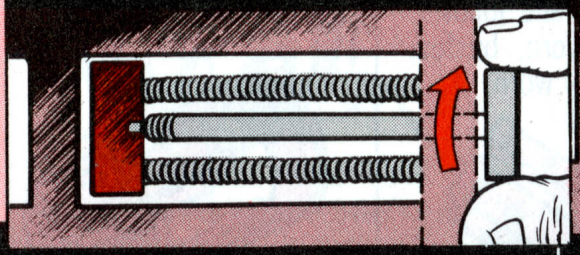
Best bet: Put plenty of LSA-T on the cam track every time you clean your weapon. This'll get you lots more mileage on the roller. LSA-T comes in an 8-oz tube, FSN 9150-949-0323.

Setting Firing Pin Tolerance

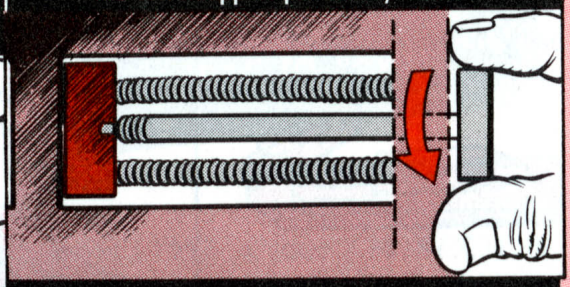
Every time you're field-stripping and re-assembling your launcher, be mighty sure to heed the special instructions in para 3-21 of your -12 TM. You'll save mucho time and sweat and maybe a mission or two.

F'rinstance, when you're putting the drive assembly back together, you've got to set the firing pin tolerance exactly right before you install the drive assembly . . . and this can be a neat trick. Here's how it goes:

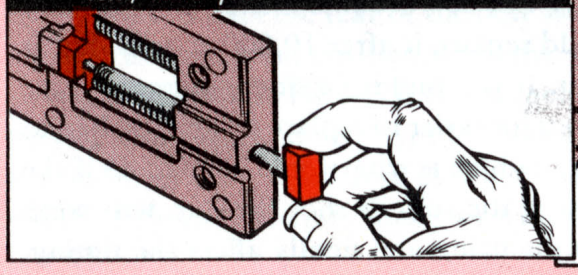
1. Screw the hammer block clockwise into the spring block till you can see a gap between the spring block and the drive support.



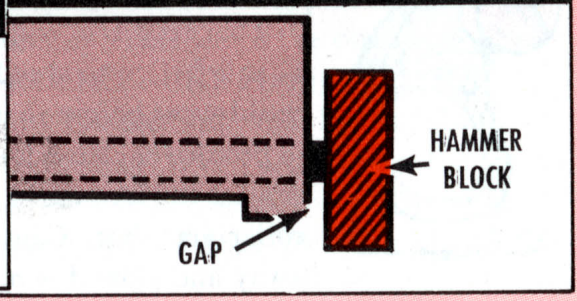
2. Next, unscrew the hammer block counter-clockwise till the spring block and the drive support just barely touch.



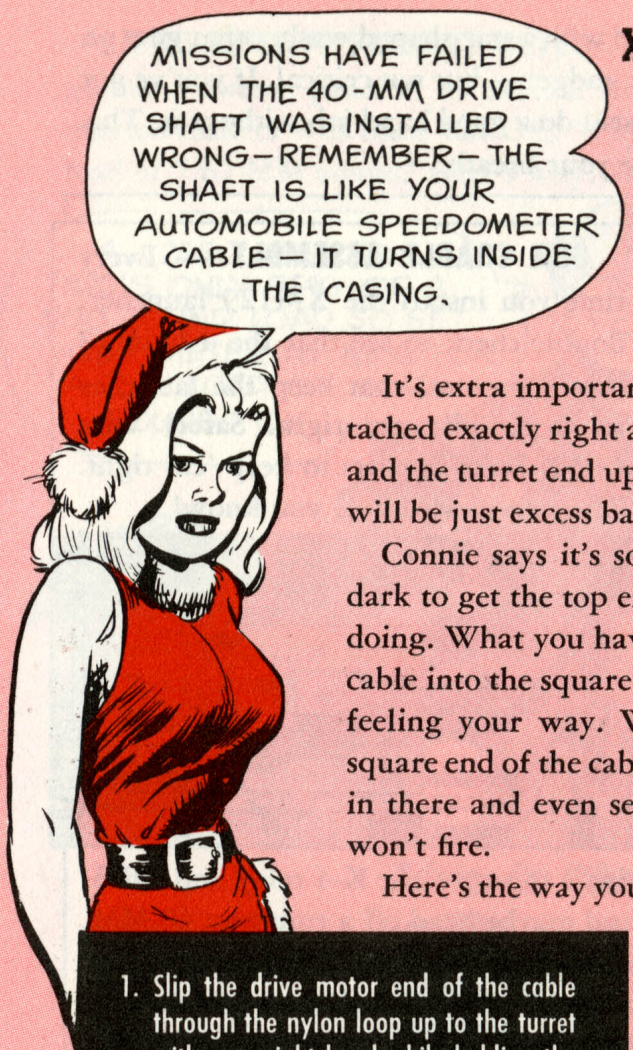
3. Now unscrew the hammer block counter-clockwise a tiny bit more till the hammer block is perpendicular (upright) to the drive support — not more than a 1/2 turn, mind you!

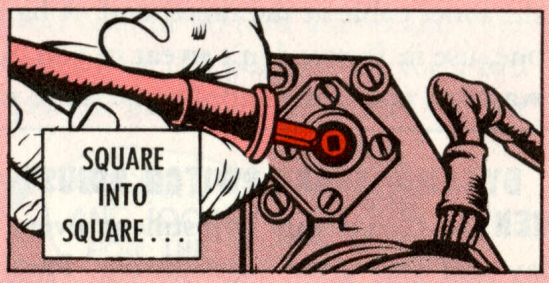


4. Lastly, doublecheck that there's a gap between the hammer block and the end of the drive support. You don't need a gage for this, either.



XM129 Drive Shaft



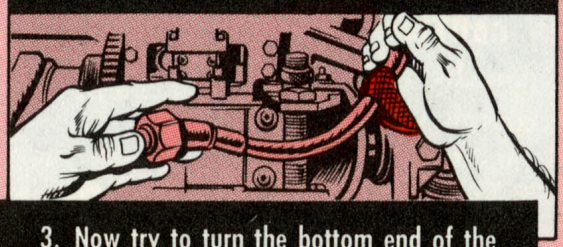


It's extra important to make sure the gun drive shaft is attached exactly right at both ends—the drive end down below and the turret end up above. Otherwise your 40-MIKE-MIKE will be just excess baggage on the Cobra.

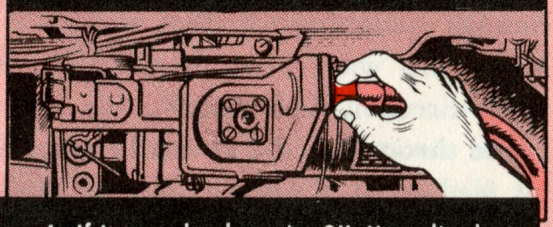
Connie says it's something like threading a needle in the dark to get the top end right, since you can't see what you're doing. What you have to do is to work the square end of the cable into the square hole in the gun drive motor assembly by feeling your way. What you have to avoid is putting the square end of the cable next to the square hole. Sure, it'll slide in there and even seem to tighten up OK, but the launcher won't fire.

Here's the way you'd do it on a left-mounted launcher:

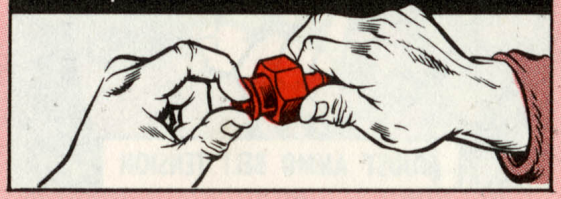
1. Slip the drive motor end of the cable through the nylon loop up to the turret with your right hand while holding the gun end with your left.



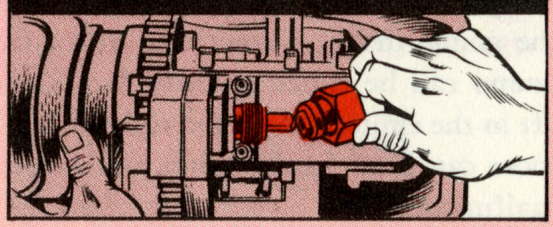
2. Find that inner square hole with your finger and then guide the square end of the flex shaft into it. Slide the nut over the end of the casing and handtighten it.



3. Now try to turn the bottom end of the flex shaft at the lower end, but be careful you don't tug it out of the square hole above. If it turns real easy, no good — you've got to start over at the top.



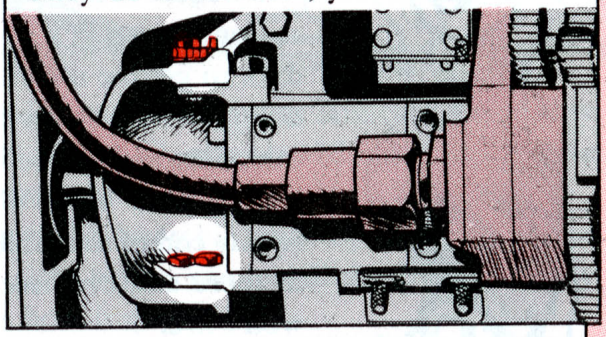
4. If it turns hard, you're OK. Now slip the square end of the cable all the way over the square tip at the gun end and handtighten the nut. Handtighten top and bottom, remember. No wrench!



Incidentally, new cables come equipped with a star-shaped washer that goes on the inner cable at the turret end. A handy gadget—but not critical. If you've got one, use it; if not, don't sweat it, you can still do a good hand job without it. This washer's not in the supply system, so save your breath.

DYNAMIC BRAKE SWITCH ADJUSTMENT—Check this adjustment every day and also after boresighting. Para 3-19a of your -12 TM has the poop. Get the habit of eyeballing that aluminum switch cam to see that it's not bent. If it is, you may be able to straighten it out with a plastic-head hammer, but if you run into trouble with it get support to work on it. The big thing is that the cam adjustment must be just right or your 40-MM barrel may stop over a line round just ready to fire. At this point, the slightest movement of the drum or barrel could cause the gun to fire.

GUN CRADLE ASSEMBLY — Every time you install the XM129 launcher, double check to see that the 4 bolts (2 top, 2 bottom) that keep the launcher in the cradle are tight. Safety wire (.032) bolts in pairs to keep 'em tight. They do work loose, you know!



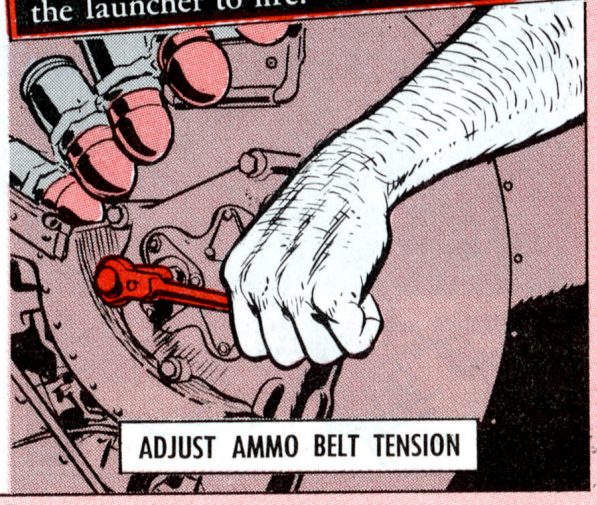
Insulate the 40-MM recoil switch terminals to stop some K-4 relay and CR-3 diode burnouts in your speed controller, and maybe head off a runaway 40-MM if expended 7.62-MM links short out terminals by piling up in the turret gimbal.

Use epoxy or rubber-type compound to insulate 'em. Eyeball now and then to make sure they're covered.

40-MM LOADING TIP—You can discourage jamming of the 40-MIKE-MIKE this way: Turn magazine in a feed direction and hand-guide first round through feed tray until engaged by feed pawl. Continue feed as you hand-rotate launcher drum to a point where the barrel just starts to close over the round.

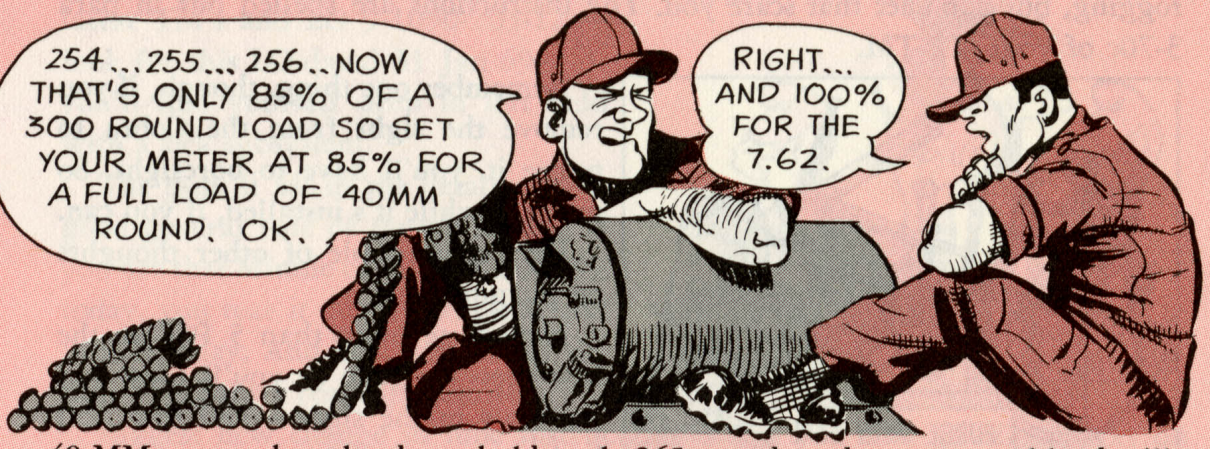
Adjust ammunition belt tension by using a ratchet wrench on the shaft of the ammo drum. Then check to see if ammo can be rolled slightly fore and aft in the chute. Ammo too tight or too loose can bind in the chute and cause malfunctions.

CAUTION: Continued rotation of the launcher drum—placing the barrel completely over the round—will cause the launcher to fire.



ADJUST AMMO BELT TENSION

AMMO RESERVE PERCENT METER—Play it safe and set the meter on the gunner's control panel at 85 percent for a full load of 40-MM ammo and your mission-makers will come out OK. Why not set it at 100 percent like for a full load of 7.62-MM ammo? Here's why: 100 percent on the meter means 300 for



40-MM ammo, but the drum holds only 265 rounds and your normal load will run between 250 and 265. 85 percent of 300 = 255, which is a close enough clue for the Cobra crew. For the 7.62's, on t'other hand, 100 percent on the meter = 4000 rounds. (Each gun has 2 containers of 2000 rounds each)

Advice On Other Components

SIGHTING STATION—Give it all the protection you can, like keep it in the stowed position and the reflex sight covered when you're not working on it. And watch those fingerprints!

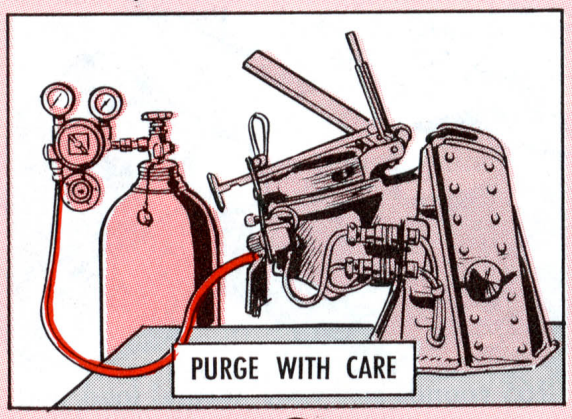
'Nother thing, always doublecheck both filaments with the filament selector switch. If one doesn't work, replace the lamp like it shows on page 3-114 of your -12 TM.

The incandescent lamp you need comes under FSN 6240-155-8689 (MS-15584-5).

PS MORE

XM73 REFLEX SIGHT—If the lenses get fogged, purge 'em dry. Use chamois cloth or a camel's hair brush—not linen rags—on the lens surfaces, the beam-splitter and crown lens. They're too easily scratched.

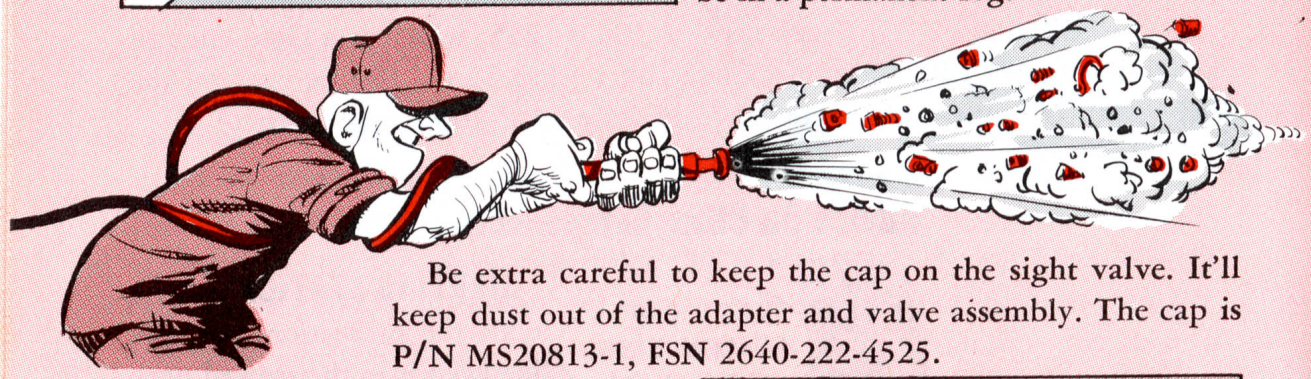
This is the first chopper sight that can be purged and charged to get rid of fogging, but don't let that scare you. The instructions are spelled out in para 3-70c of your -12 TM.


PURGE WITH CARE

Remember one thing, though, if you remove the sight from the Cobra to purge it, you'll have to boresight. So purge it while it's installed, if you can.

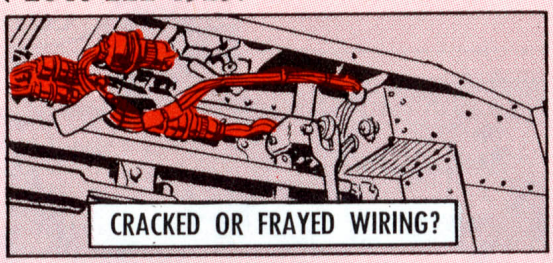
Here're a couple of other thoughts on purging:

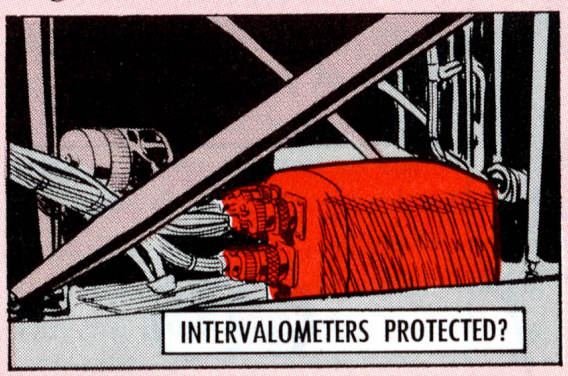
Never use more than 5 PSI on the low pressure gage or you'll blow out the seals in the sight—and then it'll be in a permanent fog.



Be extra careful to keep the cap on the sight valve. It'll keep dust out of the adapter and valve assembly. The cap is P/N MS20813-1, FSN 2640-222-4525.

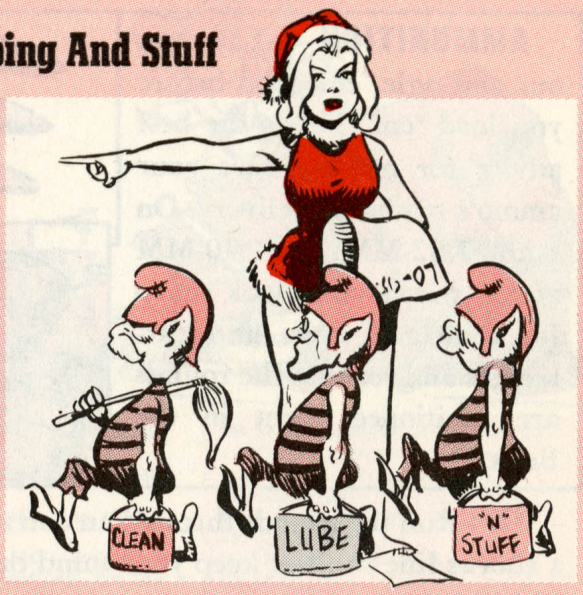
ELECTRONIC COMPONENT ASSEMBLY—Keep a sharp lookout for busted or frayed wiring and cracked or damaged plug-in circuit cards. Every time you put this assembly back in the ship, make sure the cable clamps are put back in place or the wiring will get tangled with the controls.


CRACKED OR FRAYED WIRING?


INTERVALOMETERS PROTECTED?

INTERVALOMETERS—Two big things to watch out for: Oil leaks from the Cobra's rotor transmission and damage to the electrical connectors because of clumsiness and absent-mindedness. Some units wrap the intervalometer in plastic when it's installed. Older types need shimming from beneath to keep 'em out of oil puddles, but the new ones are sealed at manufacture to prevent this trouble.

Cleaning, Lubing And Stuff



Repeat: Make gosh-darned sure you pull your PM according to the very **latest** TM's and LO 9-1090-203-12—look for this LO dated 31 Jan 69—or you'll find yourself deep in left field with a sick subsystem.

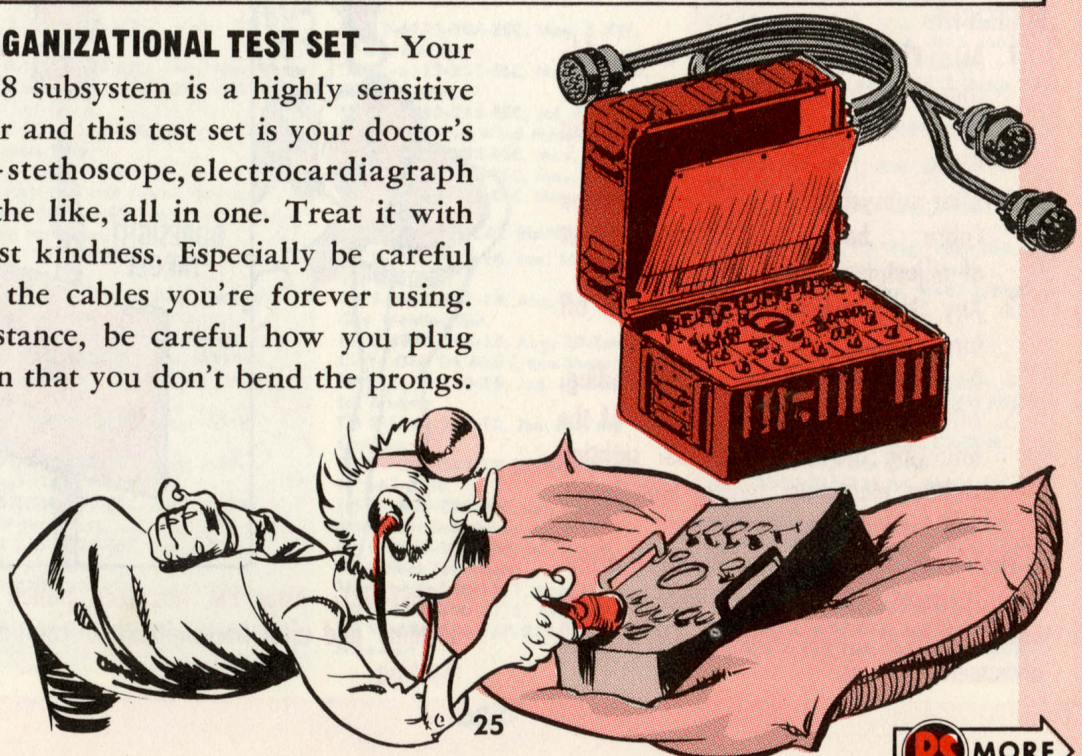
The pubs'll fill in the details, but a good general rule of thumb is this: If you fire that Minnie or 40-MIKE-MIKE today, you tear it down and clean and lube it today. And be a stickler for detail. This baby's real sophisticated.

Biggest new change in lube instructions is that you now go all the way on both shooters with PL-S (Lube Oil, General Purpose—VV-L-800) in the barrels, and LSA-T (Lube Oil, Semifluid—PD688) or GIA (Grease, Aircraft Instrument—MIL-G-23827) on the other parts. LSA is "out" for this subsystem.

This pinup will help you keep your lube supplies in order:

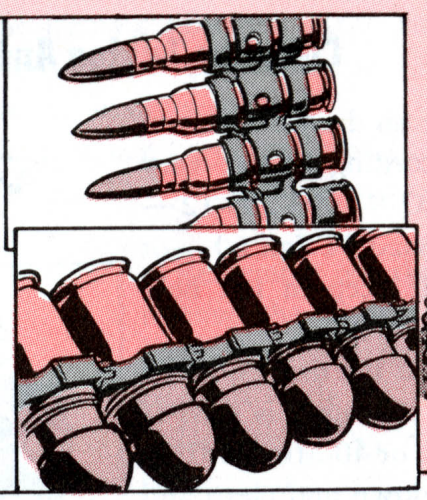
PL-S (Lube Oil, General Purpose; Preservative Special — VV-L-800)	9150-185-0629	2-oz can
	9150-273-2389	4-oz can
	9150-231-6689	1-qt can
LSA-T (Lube Oil, Semifluid, Low Friction — RIAPD-688)	9150-949-0323	8-oz tube
GIA (Grease, Aircraft Instrument — MIL-G-23827)	9150-985-7246	1-lb can

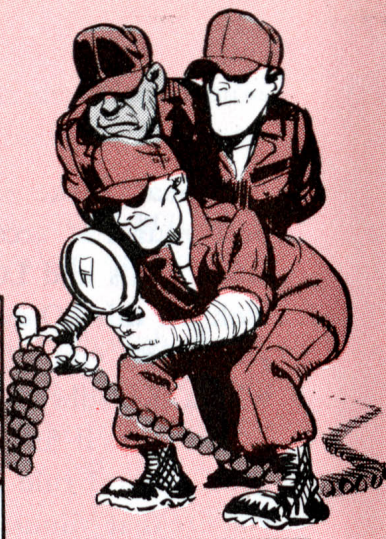
ORGANIZATIONAL TEST SET—Your XM28 subsystem is a highly sensitive critter and this test set is your doctor's kit—stethoscope, electrocardiagraph and the like, all in one. Treat it with utmost kindness. Especially be careful with the cables you're forever using. F'rinstance, be careful how you plug 'em in that you don't bend the prongs.



PS MORE

AMMUNITION — Lay 'em out and ogle 'em good before you load 'em. That's the best advice for making sure your ammo's ready for delivery. On both 7.62-MM and 40-MM ammo you have to look sharp for damaged links and cartridges and see that the rounds are positioned right in the links.





TIP: Run the rounds through an entrance chute end — like a chorus line . . . but keep your mind on what you're doing. This'll help you see any faults they have.

The yellow-headed M384 HE round is especially dangerous. Never keep live ones lying around . . . and if you come across one that failed to fire from the launcher, hands off! Get your EOD support people to take over.

M384 HE

NEVER KEEP A LIVE ONE AROUND

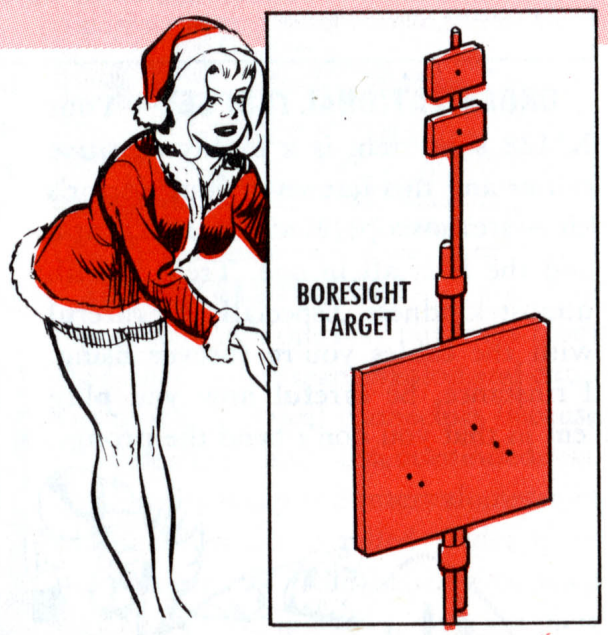
Boresighting and Test Firing

Final, important pitch: The best PM in the world will go for zero if your system's not boresighted and test-fired before that big moment. Some units skimp on these details — and then wonder why their gunship can't hit the broad side of a barn.

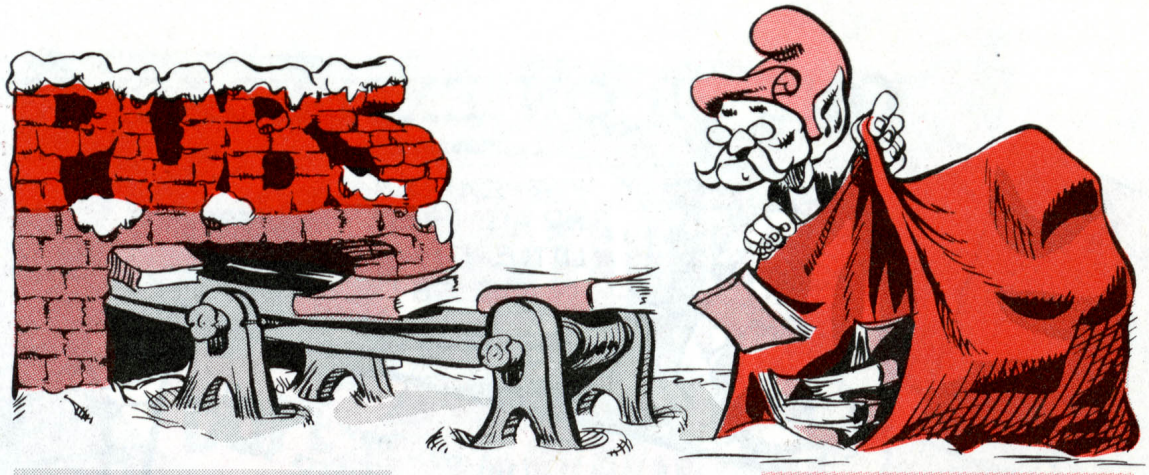
BORESIGHT:

1. After PEriodics . . . because of possible changes in hydraulic pressures or minor adjustments to the systems by you 45J's.
2. After subsystems are put back on the Cobra . . . because things might get out of adjustment through handling.
3. Any time a ship's reported to be off target during a mission.
4. Any time the Cobra has a hard landing.
5. After replacement or adjustment of the following major components: sighting station, electronics control box, turret, and individual weapons.

Note: Rocket pods or XM18/18E1 armament systems must be boresighted on an individual basis . . . not with the XM28/28E1 armament systems.



TEST-FIRE: After PM has been pulled on the systems and after boresighting to confirm boresighting.



This is a selected list of recent pubs of interest to organizational maintenance personnel. This list is compiled from recent AG Distribution Centers Bulletins. For complete details see DA Pam 310-4 (May 68), and Ch 5 (Apr 69), TM's, TB's, etc.; DA Pam 310-6 (July 69), SC's and SM's; DA Pam 310-7 (Jun 69), MWO's and DA Pam 310-9 (Apr 68), COMSEC Pubs.

ESC'S

TM 5-2400-200-ESC, May, Tracked Tractors.
TM 5-2400-204-ESC, May, Wheeled Tractors.
TM 5-3800-203-ESC, May, 20-Ton Trk Mtd Crane-Shovels.
TM 5-3800-212-ESC, May, 10-Ton Crane-Shovel Crawler.
TM 5-3810-232-ESC, May, Wheel Mtd Crane-Shovels.
TM 5-3810-233-ESC, May, 5-Ton 4X4 DED Whl Mtd Crane-Shovels.
TM 5-4300-208-ESC, May, Under 5 CFM Air Comp.
TM 5-6100-201-ESC, May, 5-KW 400-Cyc Gen Sets.
TM 5-6100-207-ESC, May, 10-KW 400-Cyc Gen Sets.
TM 5-6100-219-ESC, May, Trailer Mtd Gen Sets.
TM 5-6100-221-ESC, May, 7.5-KW DC Gen Sets.
TM 9-1005-299-ESC, Jun, Armament Subsystem XM35, 7.62-MM MG High Rate TAT-102A.
TM 9-1015-221-ESC, May, 106-MM Recoilless Rifle.
TM 9-1025-200-ESC, Jun, M114/M114A1 155-MM Towed Howitzer.
TM 9-1030-203-ESC, May, M115 8-In Towed Howitzer.
TM 9-1055-203-ESC, May, Honest John.
TM 9-1055-217-ESC, May, XM3 2.75-In Rkt Launcher.
TM 9-1400-300-ESC, Jun, Sergeant.
TM 9-2300-257-ESC, Jun, M113A1, M577A1, M106A1, M125A1, M132A1 Carriers.
TM 9-2320-247-ESC, May, M548 Carrier.
TM 9-2350-202-ESC, May, M42, M42A1, Twin 40-MM.
TM 9-2350-217-ESC, May, M108/M109 Howitzers.
TM 9-2350-222-ESC, Jun, M728 Combat Engr Veh.
TM 9-2350-224-ESC, Jun, M48A3 Tank.
TM 9-2350-230-ESC, May, M551 Sheridan.
TM 9-2350-300-ESC, May, XM163 AA Gun.
TM 11-806-ESC, Jun, OA-1754/GRC Radio.
TM 11-1510-201-ESC, May, U-8D, U-8E, U-8F.
TM 11-1510-201-ESC-1, May, RU-8D.
TM 11-1520-204-ESC, Apr, OH-13E, OH-13G, OH-13H, OH-13S.
TM 11-1520-206-ESC, Apr, OH-23B, OH-23C, OH-23D, OH-23F, OH-23G.
TM 11-1520-214-ESC, Apr, OH-6A.
TM 11-5038-ESC, May, AN/GRA-6 Radio.
TM 11-5805-202-ESC, May, AN/MTC-3 Telephone Central.
TM 11-5810-245-ESC, Jul, TSEC/KY-38 Comsec Equip.
TM 11-5815-204-ESC, Jun, AN/GRC-46, AN/VRC-29 Radios.
TM 11-5820-204-ESC, May, AN/MRC-69 Radio.
TM 11-5820-256-ESC, Jun, AN/GRC-26 Radios.
TM 11-5820-284-ESC, May, AN/GRR-5 Radio.
TM 11-5820-295-ESC, Jun, AN/GRC-19 Radio.
TM 11-5820-401-ESC/2, Apr, AN/VRC-46 Radio.
TM 11-5840-298-ESC, May, AN/PPS-5 Radar.
TM 11-6115-204-ESC, May, 5-KW, 60 Cyc Elec Gen.
TM 11-6115-231-ESC, May, 45-KW, 60-Cyc Gens.
TM 11-6660-255-ESC, Jul, AN/PMQ-6 & AN/PMQ-6A, Wind Meas Sets.
TM 55-1930-203-ESC, May, LARC LX.
TM 55-1930-205-ESC, May, LARC V.
TM 55-1930-206-ESC, May, LARC XV.

TECHNICAL MANUALS

TM 5-2805-258-14, Jun, 10 HP Mil Std Gas Eng.
TM 5-3431-227-14, Aug, Arc Inert Gas Welding Set.
TM 5-3810-288-15, Aug, 20-Ton 3/4 Cu Yd GED Trk Mtd Crane Shovel.
TM 5-4110-220-15, Jun, 15-Ton Field Ice Maker.
TM 9-1005-210-12, Jun, M1, M2 Carbine.
TM 9-1005-249-12 C2, Sep, M16, M16A1 Rifle.
TM 9-1005-298-20P, Jul, XM27E1 Armament Subsystem.
TM 9-1005-304-20P, Jul, XM59 Armament Subsystem.
TM 9-1410-500-12/1, Aug, Hawk.
TM 9-1410-500-12/2, Aug, Hawk.
TM 9-1430-250-15P/2/1, Jun, Nike-Herc.
TM 11-5835-239-12, July, OV-1A-1B-1C, CH-47A: AN/ASH-23, Sound Recorder Set, AN/ASH-24, Sound Reproducer Set.
TM 11-6625-1817-20P, Aug, OV-1A-1B-1C, CH-47A.
TM 11-6625-1818-20P, Aug, AH-1G, CH-54A.
TM 55-1510-209-20P, Jul, U-21.
TM 55-1520-209-CL, Jul, CH-47.
TM 55-1520-214-20, Jul, OH-6.
TM 55-1520-214-CL, Jun, OH-6.
TM 55-4920-222-12 C2, Sep, Fixed & Rotor Wing.
TM 55-4920-223-15, Jul, Fixed & Rotor Wing.

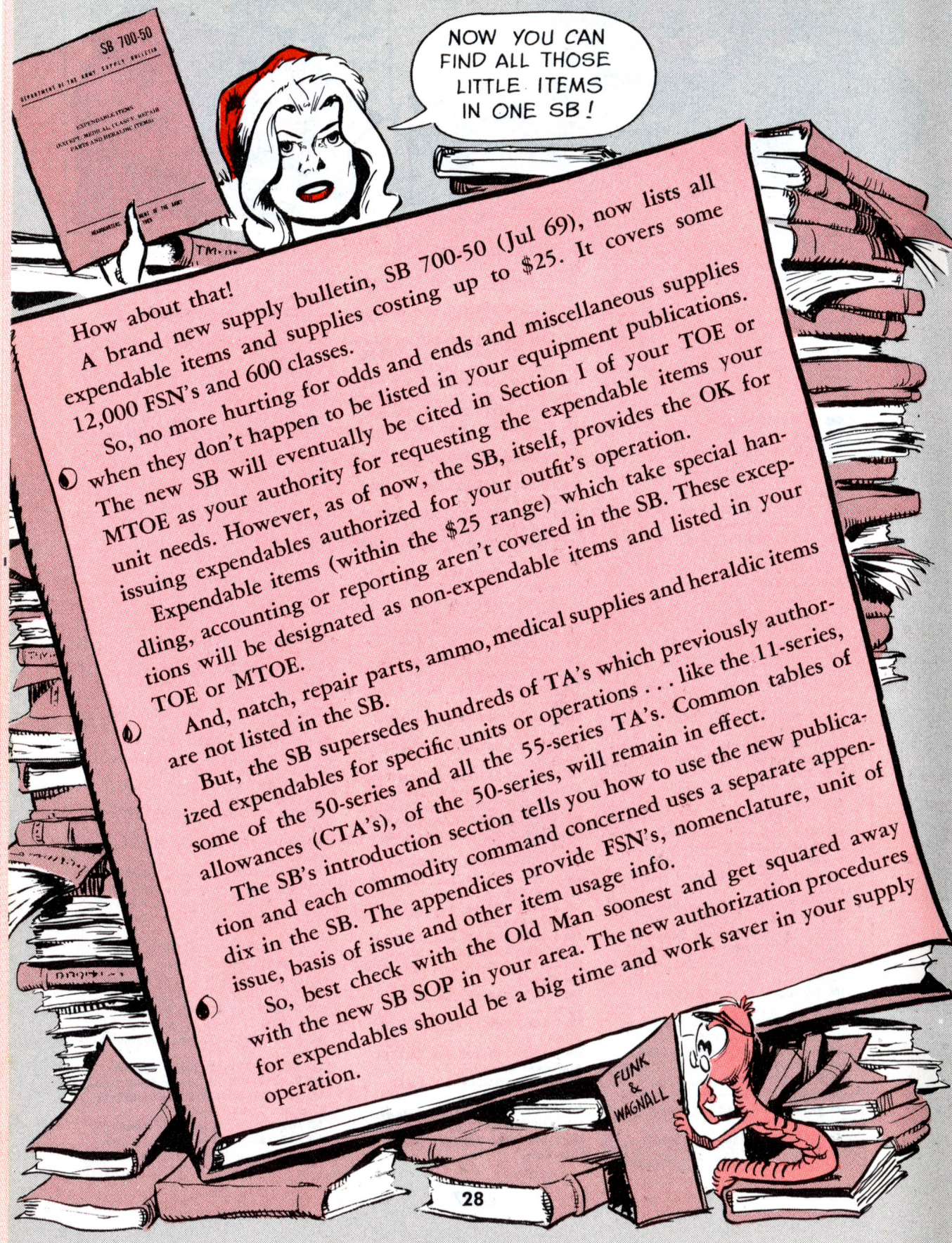
MODIFICATION WORK ORDERS

9-1015-221-20/1, Aug, M40A1 Recoilless Rifle.
9-1240-307-30/1, Aug, M101, M101A Howitzer.
9-1430-251-30/37, Jul, Imp Nike-Herc.
9-1430-512-30/9, Aug, Hawk.
9-1430-512-30/10, Aug, Hawk.
9-1430-512-30/11, Aug, Hawk.
9-1430-512-30/12, Aug, Hawk.
9-1430-513-30/1, Aug, Hawk.
9-1430-513-30/2, Aug, Hawk.
9-1430-513-30/3, Aug, Hawk.
9-1440-250-30/5, Aug, Nike-Herc.
9-2320-211-30/12, Sep, M61, M63 5-Ton Truck Chassis, M54 Cargo, M543 Medium Wrecker, M51 Dump, M246 Wrecker Tractor.
9-2320-224-20/10, Aug, M114/M114A1 Carriers.
9-2320-238-30/1, Aug, M578 Recovery Vehicle.
9-2350-215-30/30, Aug, M60A1 Tank.
9-4900-250-30/12, Aug, Nike-Herc.
9-4900-500-30/69, Aug, Hawk.
9-4910-535-30/1, Sep, M48A3, M60, M60A1, M728 Tanks.

MISCELLANEOUS

LO 5-3810-290-12-1 and-2, Jun, 5-Ton 4X4 3/8 Cu Yd DED RT Whl Mtd Crane.
LO 5-4320-255-12, Jul, 210 GPM Centrif Pneum Sump Pump.
LO 9-2350-215-12, Jun, M60/M60A1 Tanks.
LO 9-2350-222-12, Jun, M728 CEV.
LO 9-2350-224-12, Jun, M48A3 Tank.
LO 10-3930-606-12-2, Jun, 6,000 Lb Cap GED Forklift Truck.
SB 700-50, Jul, Expendable Items.
SB 740-3820-97-E10, Sep, 210 CFM Trk Mtd Pneum Tool and Comp Outfit.

ONE SB ON EXPENDABLES



How about that!

A brand new supply bulletin, SB 700-50 (Jul 69), now lists all expendable items and supplies costing up to $25. It covers some 12,000 FSN's and 600 classes.

So, no more hurting for odds and ends and miscellaneous supplies when they don't happen to be listed in your equipment publications. The new SB will eventually be cited in Section I of your TOE or MTOE as your authority for requesting the expendable items your unit needs. However, as of now, the SB, itself, provides the OK for issuing expendables authorized for your outfit's operation.

Expendable items (within the $25 range) which take special handling, accounting or reporting aren't covered in the SB. These exceptions will be designated as non-expendable items and listed in your TOE or MTOE.

And, natch, repair parts, ammo, medical supplies and heraldic items are not listed in the SB.

But, the SB supersedes hundreds of TA's which previously authorized expendables for specific units or operations . . . like the 11-series, some of the 50-series and all the 55-series TA's. Common tables of allowances (CTA's), of the 50-series, will remain in effect.

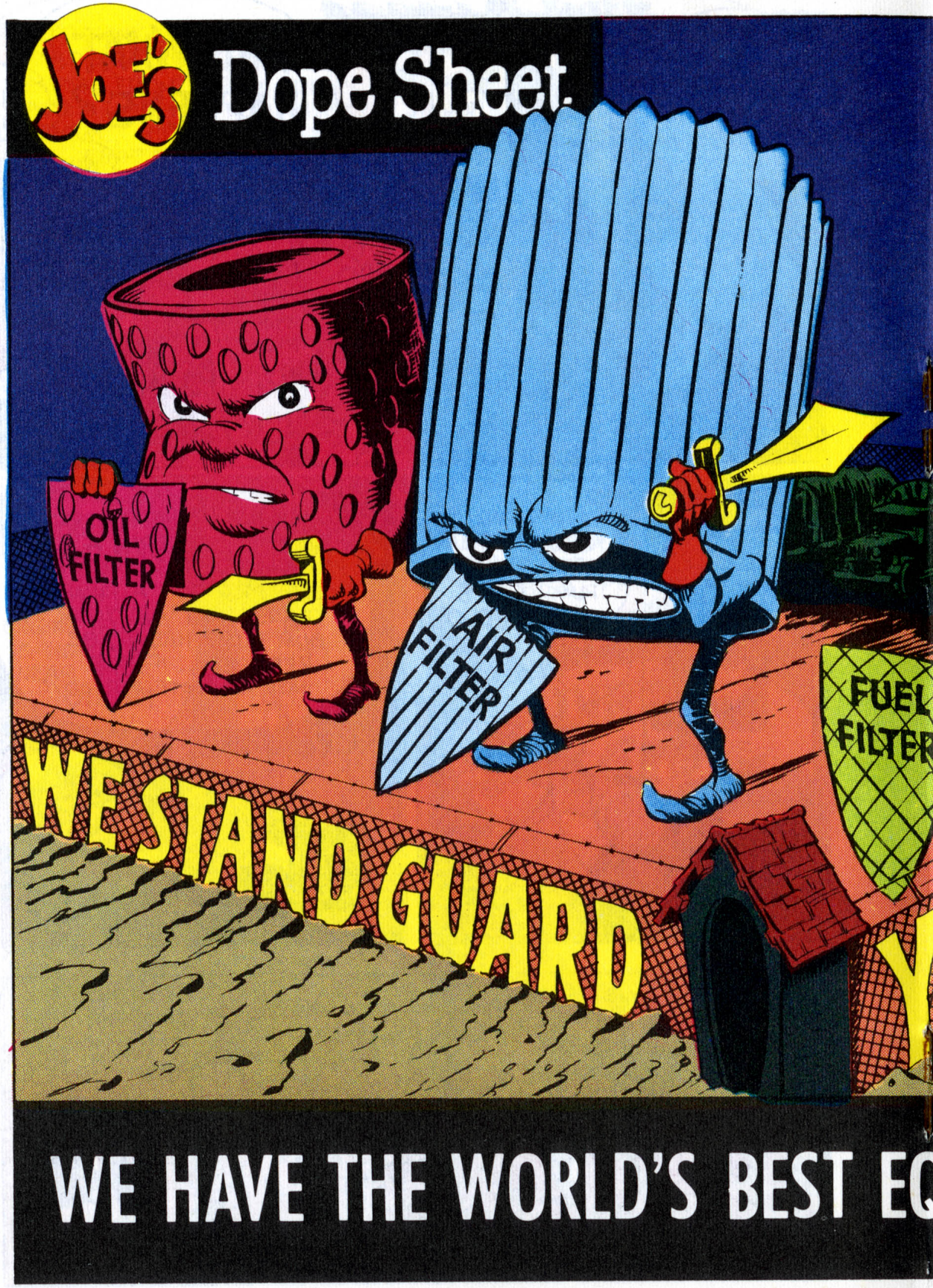
The SB's introduction section tells you how to use the new publication and each commodity command concerned uses a separate appendix in the SB. The appendices provide FSN's, nomenclature, unit of issue, basis of issue and other item usage info.

So, best check with the Old Man soonest and get squared away with the new SB SOP in your area. The new authorization procedures for expendables should be a big time and work saver in your supply operation.

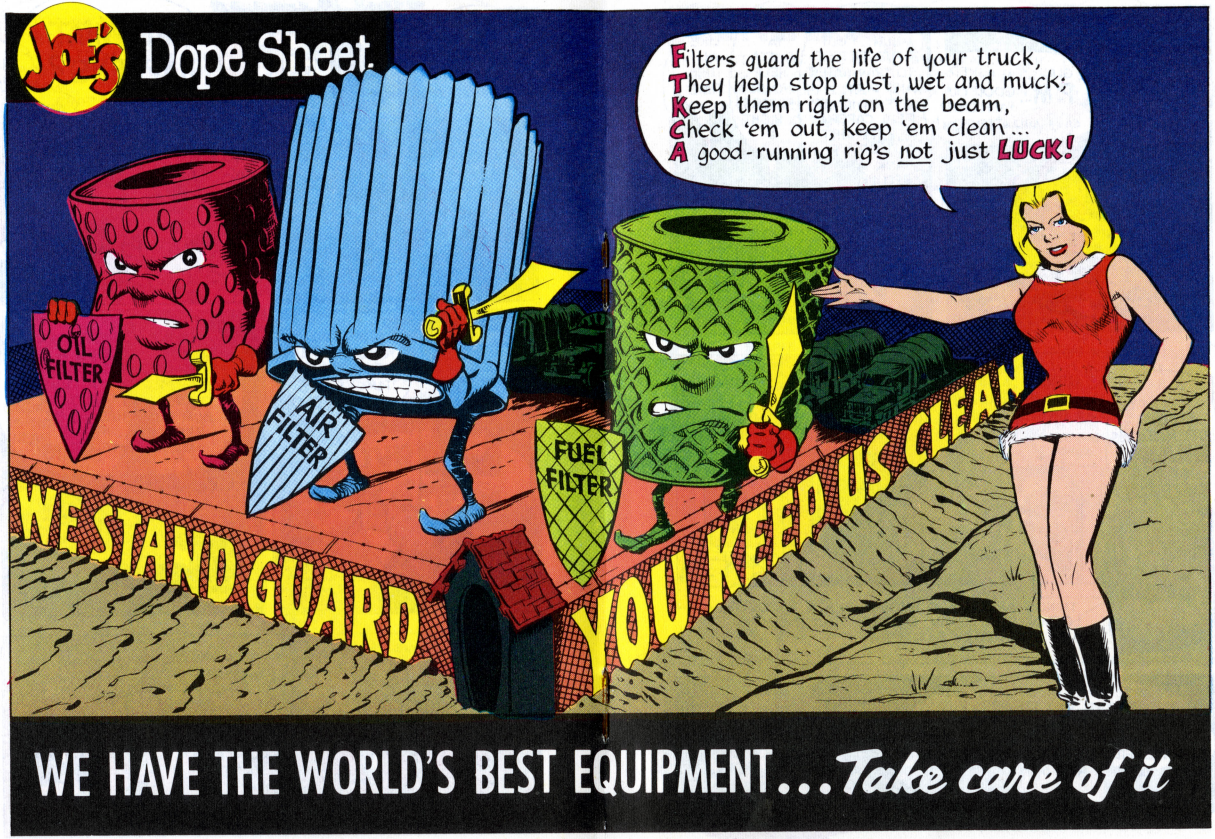
JOE'S DOPE
FILTERS STAND GUARD
S.C.L.AUS
HQ-N.POLE DEPOT
N.POLE ELF BN.(D.S.)
S. CLAUS, COMMANDING
CHECKS CASHED
YOUR DEROS CALCULATED BY RESIDENT ASTROLOGER FREE CONSULTATION
!!!! FILTERS... YOU'D THINK THERE'D BE A BIG DEMAND FOR FILTER ELEMENTS FOR MULTIFUEL TRUCKS, EH? EH?
WHY, SURE, THERE'RE A LOTTA MULTI'S RUNNIN' AROUND!
YUP!! THE TM'S AND LO'S CALL FOR REGULAR CHANGIN' OF FILTER ELEMENTS--FUEL, OIL AND AIR CLEANER.
O.D. G
Nam
...YOU'D THINK WHAT WITH DUST, HEAT AND WET OUT THERE, DEPOTS WOULD BE IN A BIND JUST SUPPLYING THE DEMAND...!!! ...RIGHT???

YOU'D THINK THE UNIT MECHANIC WOULD BE DRAWING FILTER ELEMENTS FROM SUPPLY ROOMS FASTER THAN THEY COULD SUPPLY THEM!! RIGHT?... RIGHT?? RIGHT?? RIGHT??
RIGHT!
RIGHT!
RIGHT!
WRONG!
THE DEMAND FOR FILTERS FOR MULTIFUEL ENGINE TRUCKS IS NOWHERE NEAR WHAT IT OUGHT TO BE!
MULTIFUEL FILTER ELEMENT DEMAND
MULTIFUEL TROUBLES
... AT THE SAME TIME A LOT OF PEOPLE ARE HAVING TROUBLE WITH THEIR MULTI'S... ENGINE PARTS FAILURES AND SUCH...
... AND WHAT'S THE BIGGEST CAUSE OF THESE TROUBLES...?? HAH??
I'LL TELL YOU!
DIRTY AND CLOGGED FILTERS
FUEL
OIL
AIR

FUEL FILTERS
DIRT AND WATER GET INTO THE FUEL INJECTION PUMP...
DIRTY FUEL FILTER
AND WHAT HAPPENS?
HUH?? WHAT??
WHAT?
WHAT?
DUH... WHAT?
THAT FINELY-MACHINED PUMP ...THAT Touchy PUMP GETS KNOCKED OUT KAPUT... DAID POW
...THEN YOUR BIG, POWERFUL TRUCK IS SICKER'N A DOG - AND HAS TO GO TO SUPPORT FOR A PUMP "TRANSPLANT" AND YOUR BUM PUMP HAS TO BE REPAIRED... IF IT'S NOT TOO LATE ALREADY!
ALL.. BECAUSE THE FUEL FILTERS WERE TOO DIRT-LOADED TO CATCH A LITTLE WATER OR A FEW SPECKS OF DIRT...
BAW!
SOB
HEY, SANTA, CAN I PUT THIS PS PIN-UP HERE?



IF YOU WANT TO DISPLAY THIS CENTERPIECE ON YOUR BU



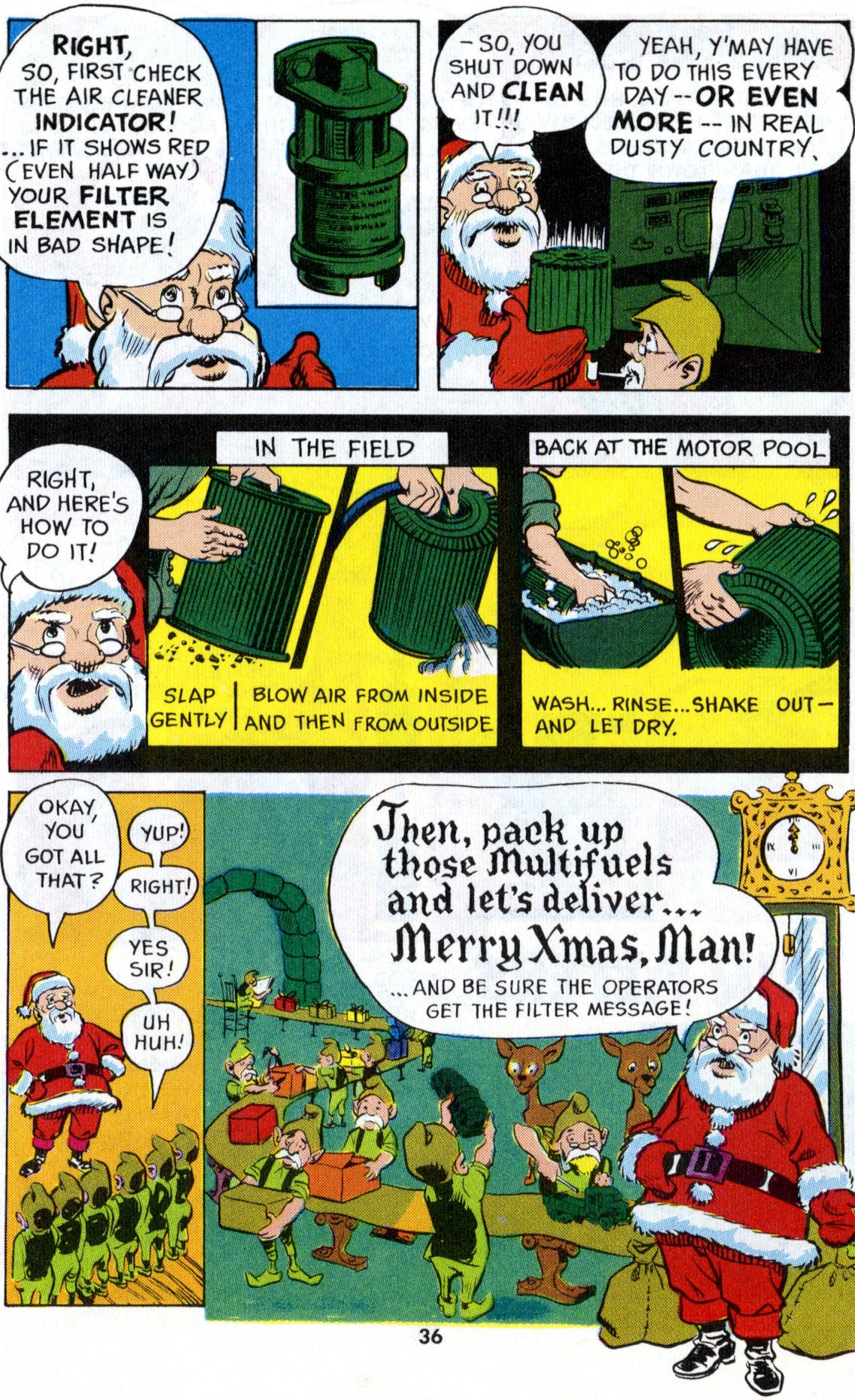
IF YOU WANT TO DISPLAY THIS CENTERPIECE ON YOUR BULLETIN BOARD, OPEN STAPLES, LIFT IT OUT AND PIN IT UP.

QUIPMENT... *Take care of it*

LLETIN BOARD, OPEN STAPLES, LIFT IT OUT AND PIN IT UP.

SO, WHAT'S THE SOLUTION TO THE FUEL PUMP PROBLEM?
GLAD YOU ASKED... P.M... GOOD OL' FASHIONED CARE AND ATTENTION!
...IN A MULTI... Y'GOT 3 FUEL FILTERS TO TRAP WATER AND DIRT... EVEN THO' Y'R REAL CAREFUL TO KEEP DIRT OUT OF Y'R TANK WHEN REFUELING.
BUT... YA GOTTA HELP YOUR FILTERS! ...RIGHT?
RIGHT! LIKE ALL THE TIME
EVERY DAY BEFORE OPERATIONS, DRAIN ALL 3 FILTERS
CATCH FUEL IN A CLEAN JAR AND CHECK IT FOR SIGNS OF DIRT AND WATER
BLACKISH COLOR... OR SPECKS FLOATING AROUND MEANS DIRT...
YOU'LL SPOT WATER WHEN IT SETTLES TO THE BOTTOM
THINGS ARE IN BAD ENOUGH SHAPE IF YOU GET A LOT OF DIRT COMIN' OUTTA YOUR PRIMARY AND SECONDARY FILTERS.
YOU'VE GOT REAL TROUBLE IF DIRT 'N' WATER ARE GETTING THROUGH TO YOUR FINAL FILTER... GET YOUR MECHANIC TO SERVICE ALL 3 FILTERS!

OIL FILTERS
KEEP OUT CARBON, BITS OF METAL DIRT PRODUCED BY THE ENGINE... KEEPS THE OIL THAT FLOWS THROUGH YOUR ENGINE CLEAN!
THE NORMAL SERVICE (PER THE LO) IS 3000 MILES OF OPERATION... OR EVERY THREE MONTHS, WHICHEVER COMES FIRST!
BUT OUT IN 'NAM OR SEA... THIS MAY NOT BE ENOUGH
TAKE A CRANK-CASE SAMPLE
SO, Y' CHECK IT OFTEN ...LIKE EVERY TWO WEEKS
LO9-2320-209-12 -12 (OCT 68)
2½ TON
NOTE 3
LO 9-2320-211-12 (ARR 68) NOTE 5
5 TON
IF THE SAMPLE YOU TAKE LOOKS DIRTY... DO THIS!
DRAIN CRANKCASE COMPLETELY AND ADD NEW OIL
INSTALL NEW OIL FILTERS CAREFULLY
IF THEY'RE NOT INSTALLED RIGHT F-O-R-G-E-T IT!!! SHE'LL LEAK LIKE A WEEK-OLD CHILD... AND BE SURE YOU POSITION THE CUP WITH THE NARROW END DOWN.
AIR FILTERS
AN AIR FILTER KEEPS THE ENGINE BREATHING CLEAN AIR... AND GIVES IT ENOUGH TO OPERATE ON!
IF SHE'S SMOKING BLACK EXHAUST OR POOPING OUT... OR THE ENGINE'S MISSING — IT MAY HAVE A CLOGGED FILTER!


RIGHT, SO, FIRST CHECK THE AIR CLEANER INDICATOR! ...IF IT SHOWS RED (EVEN HALF WAY) YOUR FILTER ELEMENT IS IN BAD SHAPE!
-SO, YOU SHUT DOWN AND CLEAN IT!!!
YEAH, Y'MAY HAVE TO DO THIS EVERY DAY -- OR EVEN MORE -- IN REAL DUSTY COUNTRY.
RIGHT, AND HERE'S HOW TO DO IT!
IN THE FIELD
SLAP GENTLY
BLOW AIR FROM INSIDE AND THEN FROM OUTSIDE
BACK AT THE MOTOR POOL
WASH... RINSE... SHAKE OUT— AND LET DRY.
OKAY, YOU GOT ALL THAT?
YUP!
RIGHT!
YES SIR!
UH HUH!
Then, pack up those Multifuels and let's deliver... Merry Xmas, Man!
...AND BE SURE THE OPERATORS GET THE FILTER MESSAGE!

COMMUNICATIONS

GLUE GOT YOU IN A BIND?

Wanna steer clear of a sticky situation?

Keep glue off signal entrance box binding posts, which you'll find in 2 or 3 dozen varieties of commo shelters.

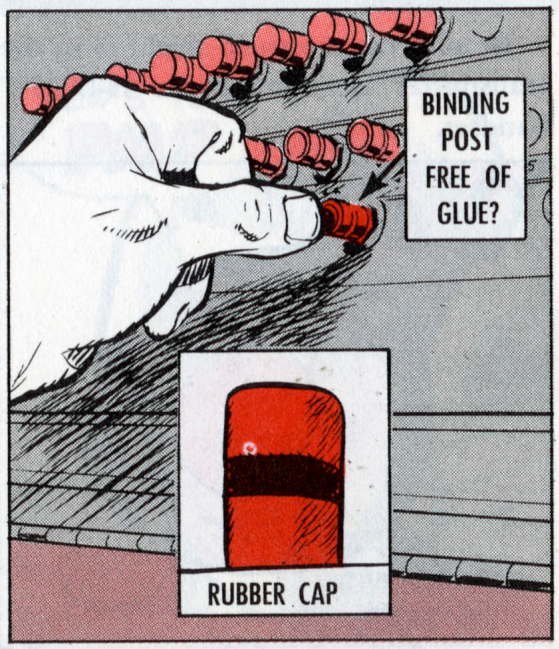
Rubber caps for binding posts like the U-106, FSN 5940-223-5293, don't need glue to keep 'em in place. They're snug enough.

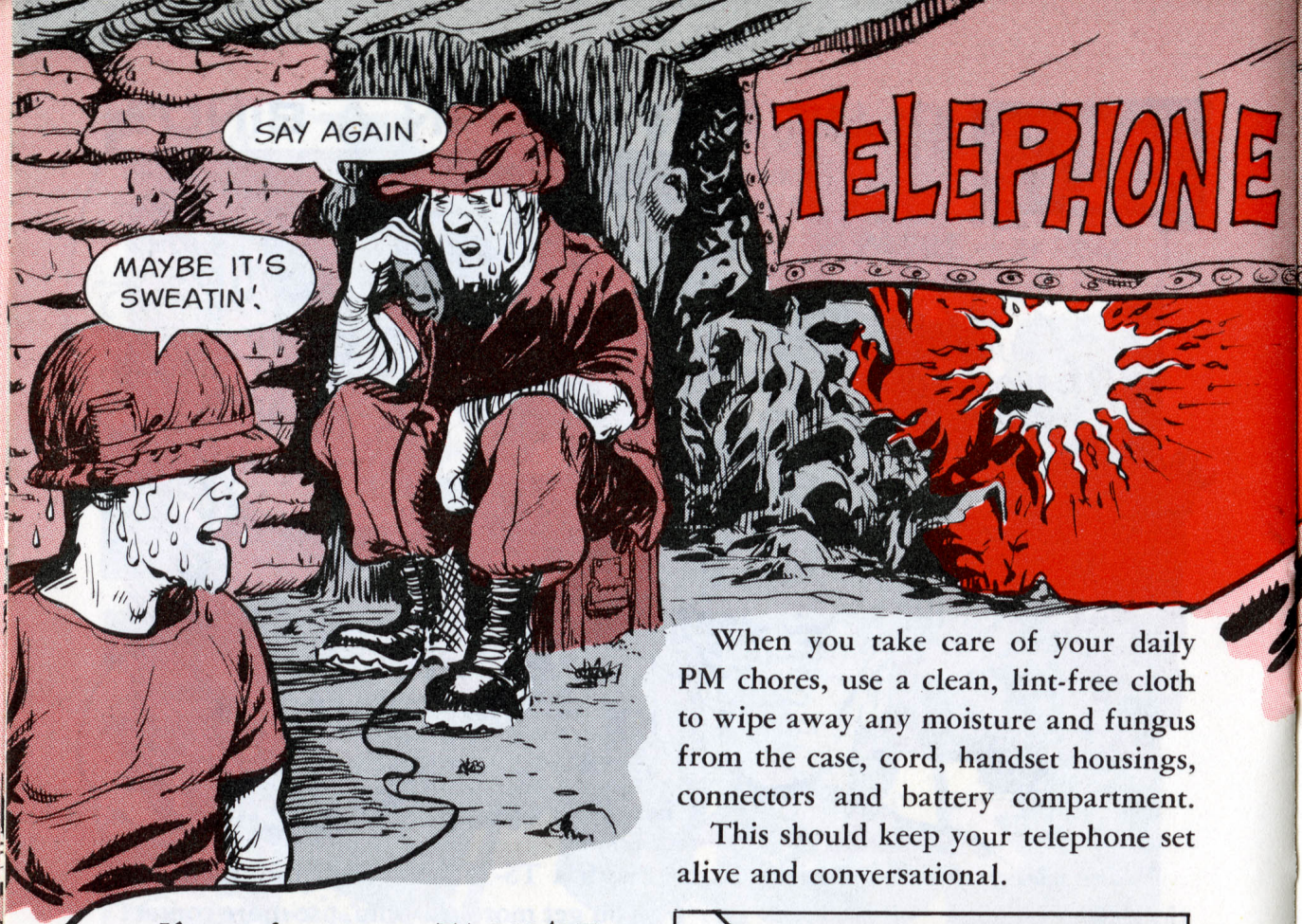
Gook gurgles into moving parts of the post, causing electrical resistance, restriction of the movement of the post, and more. Gooked up posts also increase repair time, since the posts are needed for tests. Repair people gotta clean 'em first.

So, forget the glue. You also might check your binding posts to be sure they're free of somebody else's glue. If they're gooked up, clean 'em good with contact cleaner, and be sure they operate freely.

You might also measure resistance with a TS-352 or other multimeter. If you get more'n 1 ohm, use more contact cleaner. Try moving the post in and out while you're cleaning.

Replace the rubber caps when you get the posts cleaned up . . . but don't glue 'em back.





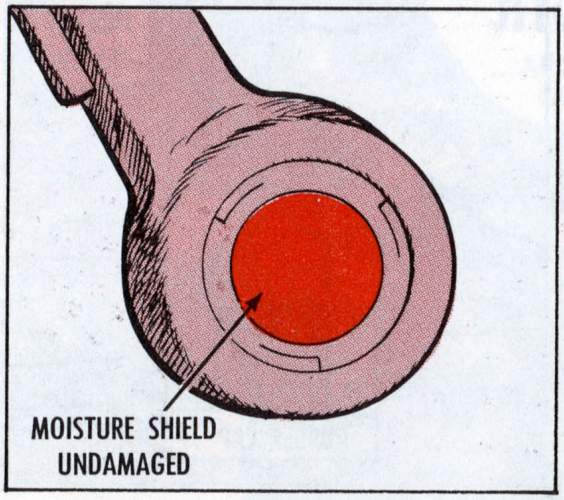
When you take care of your daily PM chores, use a clean, lint-free cloth to wipe away any moisture and fungus from the case, cord, handset housings, connectors and battery compartment.

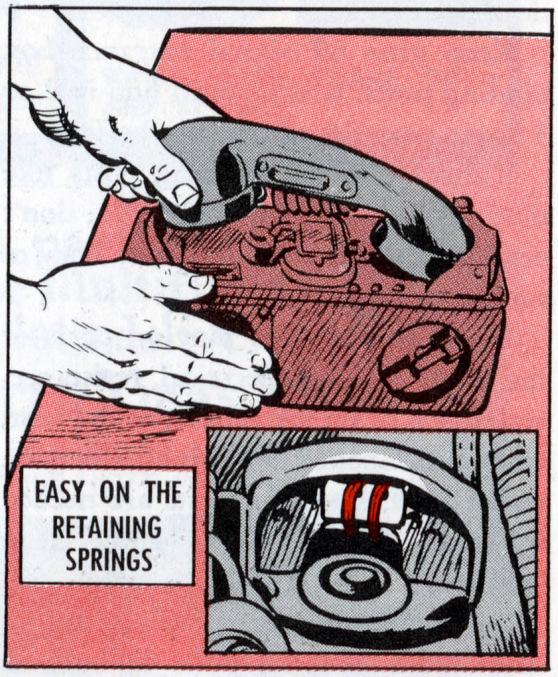
This should keep your telephone set alive and conversational.

If you favor your TA-312/PT or TA-43/PT telephone set with a generous dose of moisture-curbing TLC, it's a lead-pipe cinch you'll beef up its message-moving capacity.

Here's how:

Be sure the moisture shield is in the transmitter element of the H-60/PT handset.





Take it easy — real easy — when you put the H-60 in its cradle. If you use too much energy in positioning the handset, you can break the retaining springs.

TELEPHONE TOPICS

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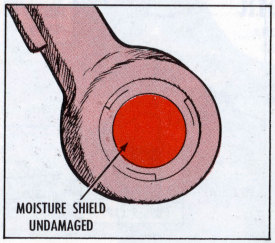
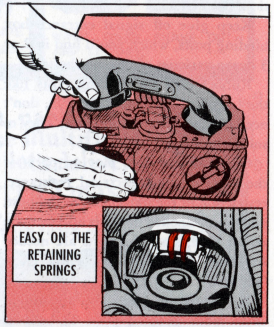
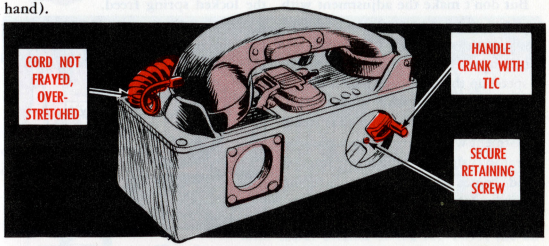




Take it easy — real easy — when you put the H-60 in its cradle. If you use too much energy in positioning the handset, you can break the retaining springs.

Fact is, when returning the handset to its cradle you should push the retaining springs back gently in the retaining cradle, and rock the handset into position in the mounting cradle.

If either spring comes up broken or fails to hold securely, get a new one. These go by FSN 5805-301-5866 (right hand) and FSN 5805-301-3865 (left hand).



Watch out for the handcrank on the G-42/PT or G-42A/PT hand ringing generator. It breaks easily. After use, fold the crank into the wheel on the generator so it won't get busted off when you're handling the telephone set.

If the crank should come up broken, get your direct support to install a replacement. It's smart PM to eyeball the retaining screw on the crank handle. Be sure it's secure. The handset cord does a good job, too — but not when it's over-stretched and pulled snapless. If this happens too much, the cord frays and breaks at the connection points.

TOPICS

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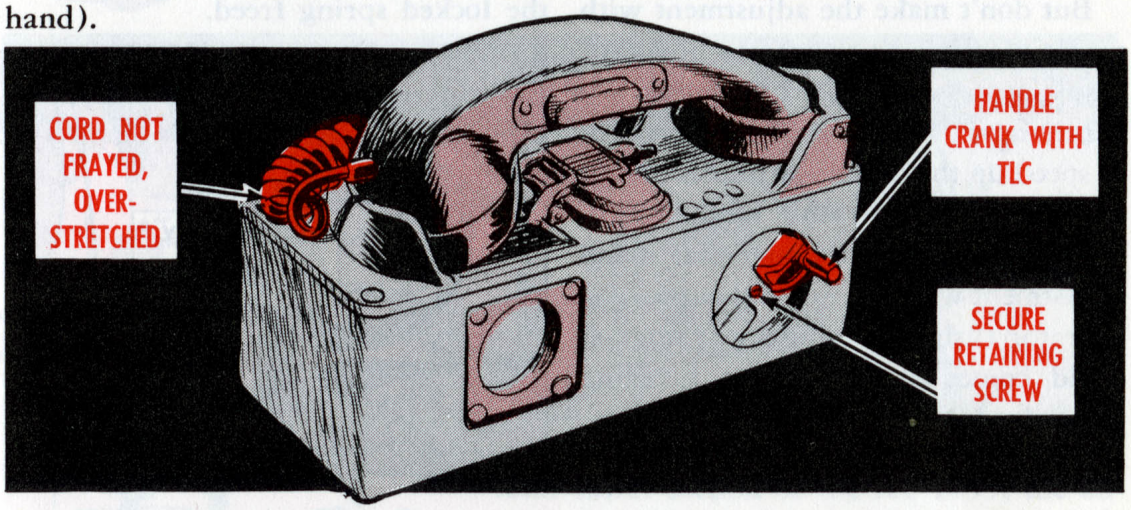

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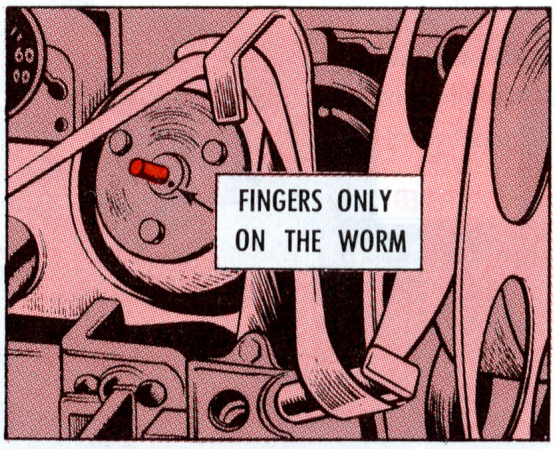
O'course you need to adjust the speed of your non-synchronous teletypewriter, whether it's a TT-4( )/TB, TT-76( )/GGC, or TT-98( )/FG.

But don't make the adjustment with a pair of pliers on the motor governor adjustment worm. Use your fingers . . . gently now . . . and push the worm in to speed up the motor, or pull it out — kinda slowly — to slow motor speed.

Truth is, pliers can burr that nylon adjustment worm so much that the next operator (usin' his adjustment fingers) could come up with some bleeding lacerations.

An over-energetic push or pull could even lock the adjustment worm spring — and that means your teletypewriter'll have to hit the road to support to get the locked spring freed.



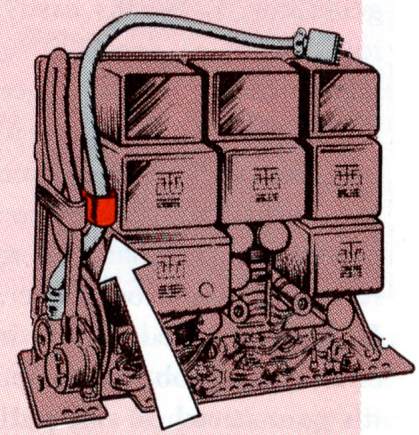
CABLE CONNECTOR SAVER

Watch out for the power cables in that AN/TCC-4, -20 telegraph terminal . . . 'specially the PP-812 connecting cable on the AM-683 amplifier-filter.

'Cause too much tugging on the AM-683 drawer can leave the cable's P804 connector broken.

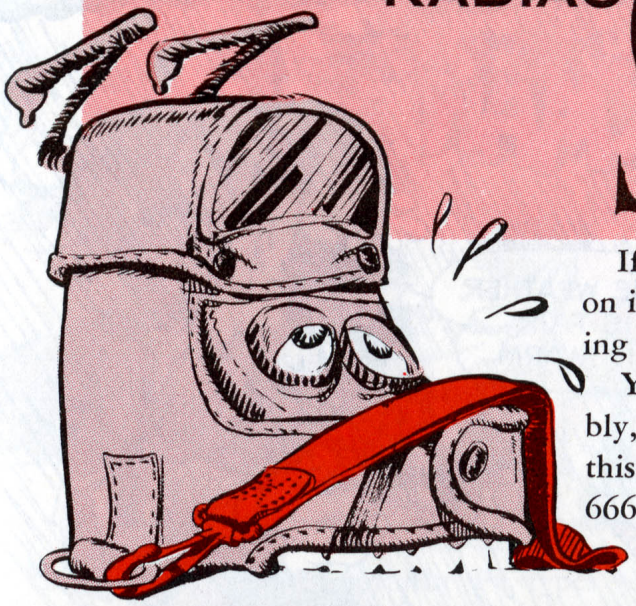
To get away from this drawer dragging, put the cable in the inside bracket.

If this doesn't take out the necessary slack get support maintenance to give the bracket a right-angle twist. This'll raise the connector out of the way when it's hooked up to the PP-812 power supply-test set.



PUT THE CONNECTING CABLE INSIDE THIS BRACKET

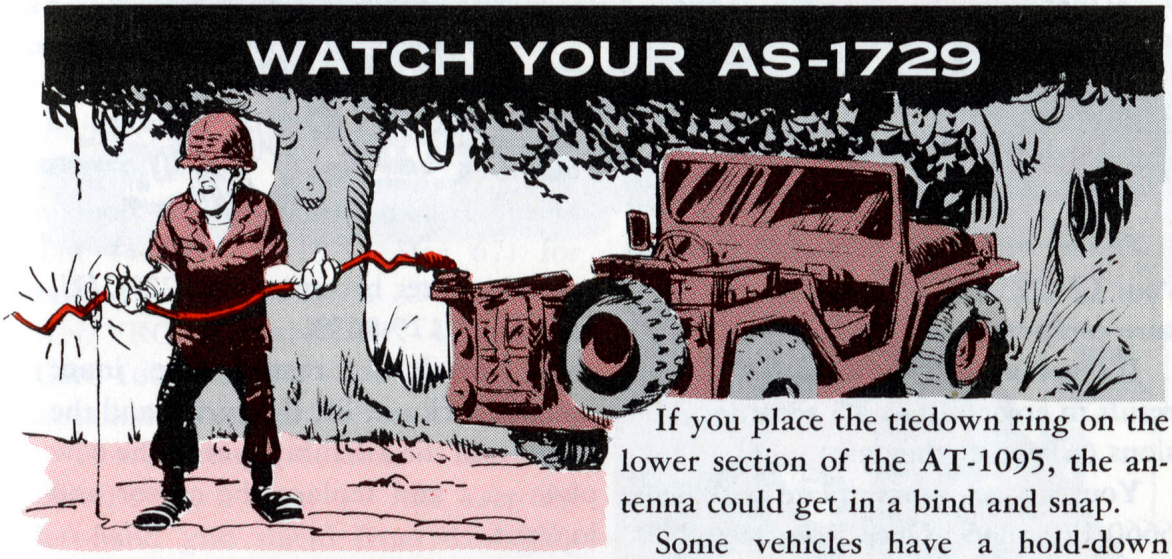
RADIAC SLACK JACK?



If your IM-174/PD radiac set's slack on its back for want of the right carrying strap, you need a new FSN.

You can get a lift with Sling Assembly, FSN 6665-646-9404. You'll find this stock number on page B-7, TM 11-6665-213-12 (Jul 69).

WATCH YOUR AS-1729



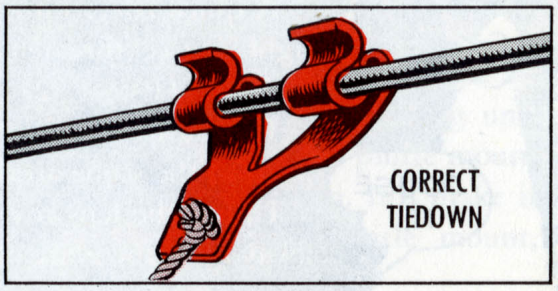
Yes, watch that AS-1729/VRC antenna. It's pretty flexible, but it can be zapped in a second if your tiedown isn't right.

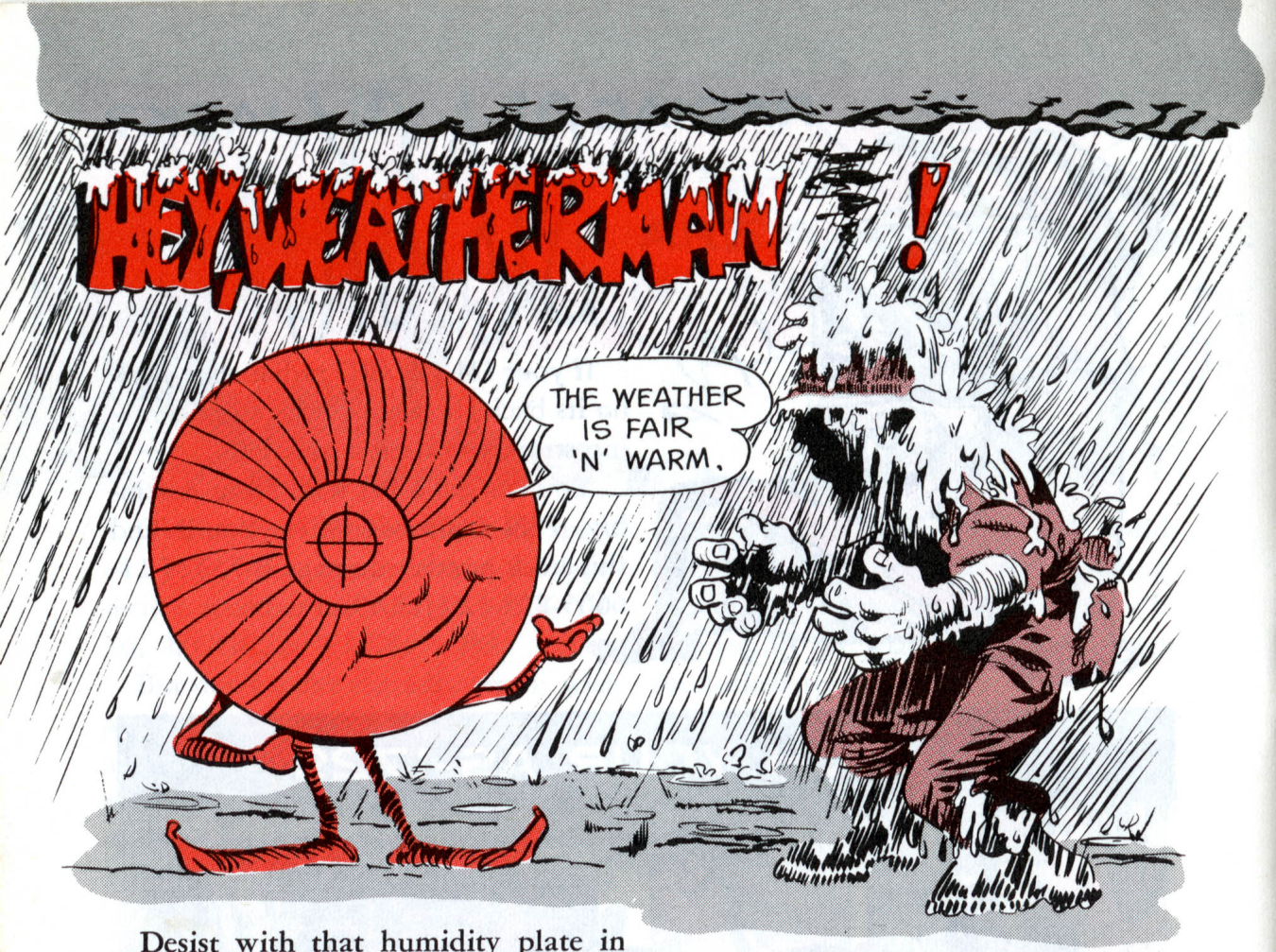
For a workable tiedown, position your tiedown ring on the upper section of your AT-1095 antenna element, about 2-1/2 feet from the tip end.

This'll bring the antenna's flexibility into play, and give it a chance to release if it has to defend itself against a misguided tree limb or trouble-causing overhead wires.

If you place the tiedown ring on the lower section of the AT-1095, the antenna could get in a bind and snap.

Some vehicles have a hold-down clamp — which shouldn't be used as a hook. The antenna snaps into the topside of the clamp, allowing it to spring up if snagged. Don't hook the antenna **beneath** the clamp. If it snags, it'll shatter.





Desist with that humidity plate in your CP-223B/UM humidity-temperature computer.

It's got an electrical fault that can result in errors up to 3.5 recorder divisions (whatever they are).

You can get a new plate with FSN 6660-179-5846. Once you install it, your computer becomes a CP-223C/U, FSN 6660-179-8633.

To install it, remove the inner knurled locknut, lift the cursor and the plate from the assembly, put in the new plate . . . and replace the cursor and locknut.

STARLIGHT, YES; SUNLIGHT, NO!

A quick cover-up is the order of the day when any bright light source threatens your ready-for-action Night Vision Sight AN/PVS-1, -2 or -3.

Exposure to headlights, sunlight or what-have-you can send parts of the scope all the way back to depot for repair.

Unless the lens cover is in place, keep your scope pointed away from the glare of any bright light source.

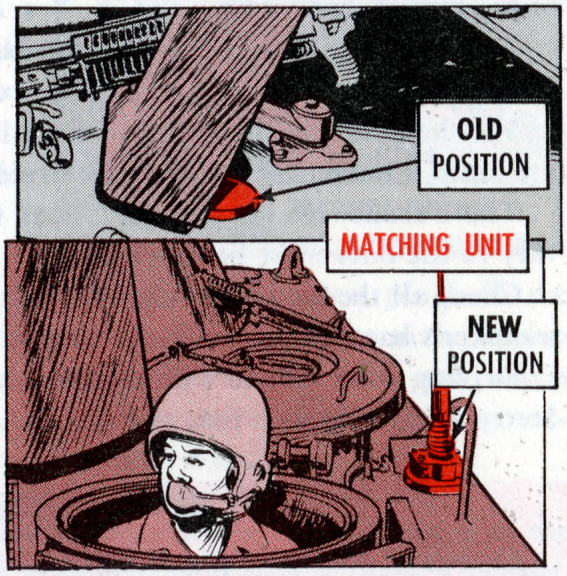
M113, M113A1 PERSONNEL CARRIER . . .

RELOCATE . . . COMMUNICATE

Hey there, you communicatin' PC types — why take chances on banging up an MX-6707/VRC antenna matching unit — either inside or outside your M113 or M113A1 armored personnel carrier?

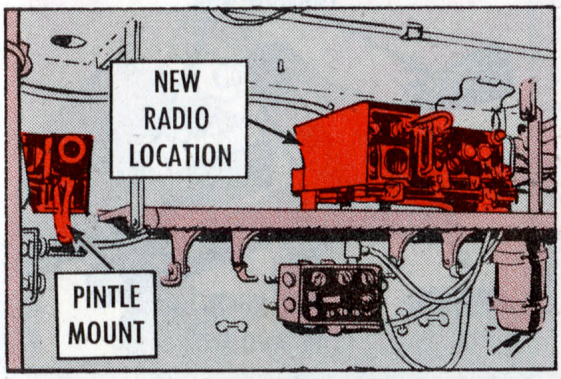
The solution's a matter of relocatin' the AT-912/VRC or the AS-1729( )/VRC antenna using the alternate method of installation spelled out in TM 11-2300-355-15-5 (Mar 67) for radio sets AN/VRC-43, AN/VRC-46, AN/VRC - 53, AN/GRC - 125, AN/GRC-160, and AN/VRC-64 (for single installations only).

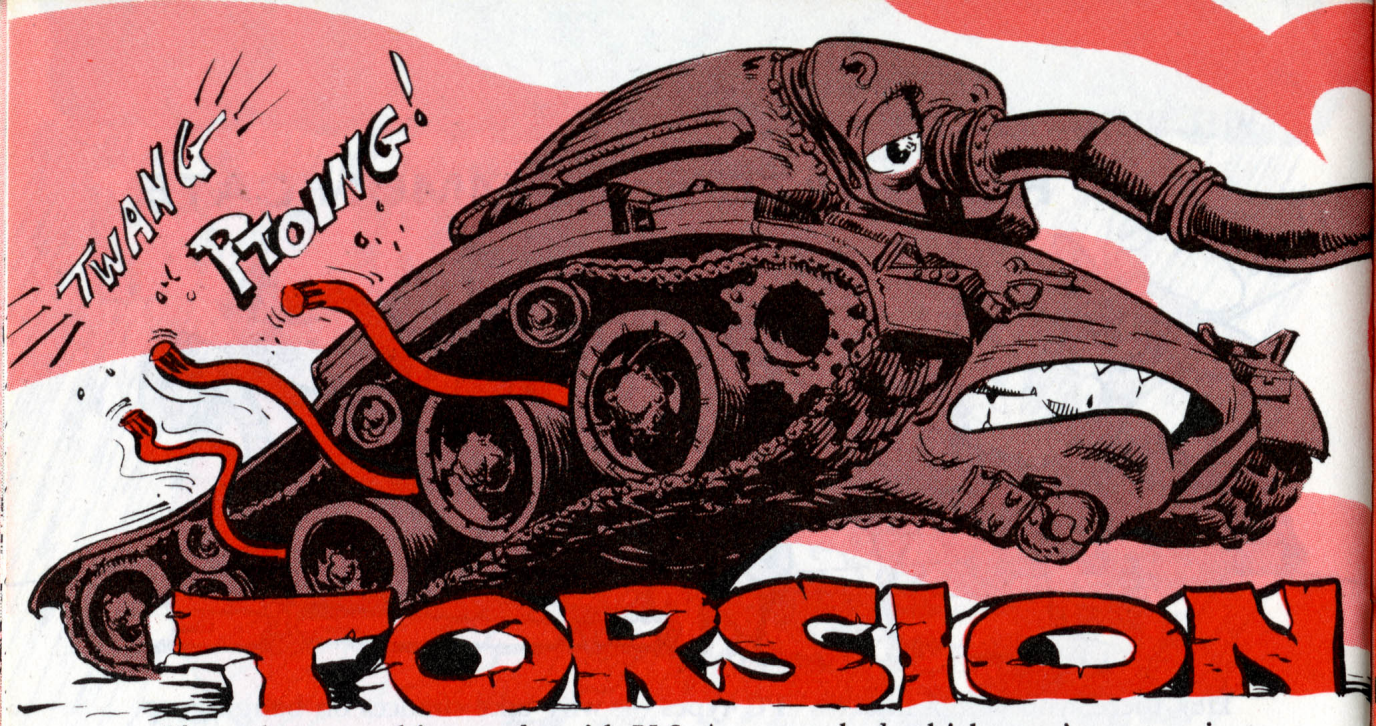
The alternate location — near the driver's hatch cover — will keep the left-hand gun shield from damaging the matching unit outside the vehicle. The hatch cover will clear the matching unit, too.



Mounted in the standard location, the antenna base AB-719/VRC or the MX-6707 can tangle with the gun shield, 'cause there's not enough clearance to avoid damage to the matching unit installation.

The relocation will also keep the inside installation of the matching unit from striking against the pintle mount of the M60 machine gun. It'll make it easier to remove the pintle mount, what's more.





TORSION

If you have anything to do with U.S. Army tracked vehicles you've got a piece of the torsion bar action.

First thing to know about torsion bars is that replacing a broken one is lots harder than keeping it from getting broken.

You keep torsion bars in one piece by driving as careful as you can so the bars are not put under any unnecessary strain. (Leave the cowboy driving to cowboys.)

The 2 front (No. 1) and the 2 rear (No. 6) bars take the most lumps . . . so they're the ones most likely to break.

Check all the bars every chance you get. Try to lift up every road wheel with a tanker's bar. If you can lift a wheel the torsion bar for that wheel is broken.

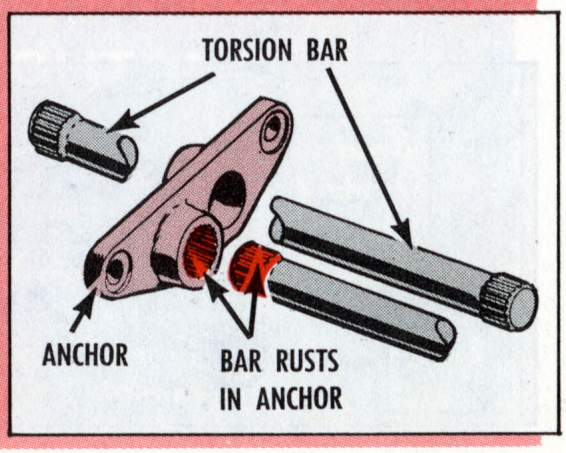
Driving your vehicle with a broken bar is a sure way to get other bars broken. So try to catch broken bars as soon as they break and replace 'em.

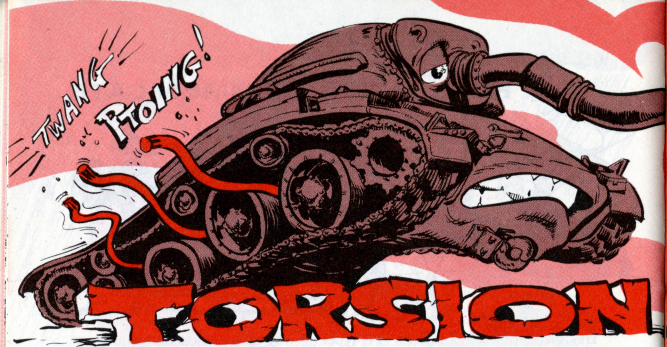
REPLACING BROKEN TORSION BARS

There's no easy, fool-proof, way to do this. The way you go about it depends on the vehicle, the position of the broken bar on the vehicle and the location of the break.

The big problem is rust . . . The torsion bar and its anchor get rusted together and when the bar breaks you have trouble getting the inboard end of it out of the anchor.

Sometimes use can you a little penetrating oil to loosen the bar in its anchor. Squirt the oil around the junction of the bar and the anchor and leave it there overnight.





TORSION BAR TWIST

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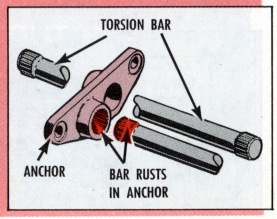

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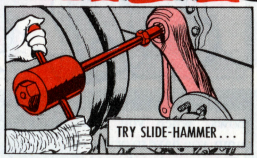
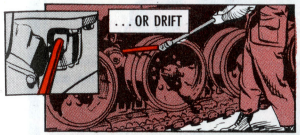
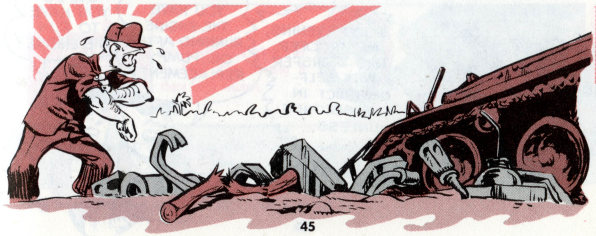
Depending on the way the torsion bar is broken you might be able to attach a slide-hammer to the hole in the end of the bar. If you can't you still might be able to spot weld the slide-hammer end to the bar and hammer away with the puller weight.





If your vehicle has access plugs in the roadwheel arm housings next to the torsion bar anchors you can take the access plugs off and drive out the broken torsion bar with a drift and hammer.

No single method will work all the time. Start with the methods listed in the vehicle technical manuals. If these don't work you can try to improvise a method. Sometimes you will find the best way only after you have tried all the others.



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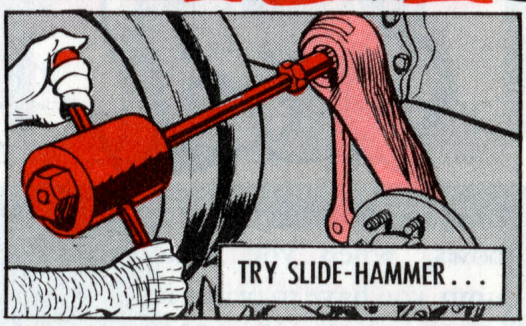

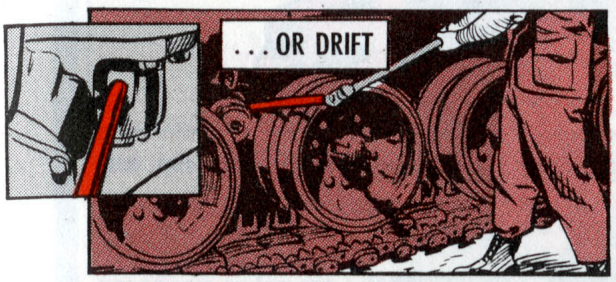

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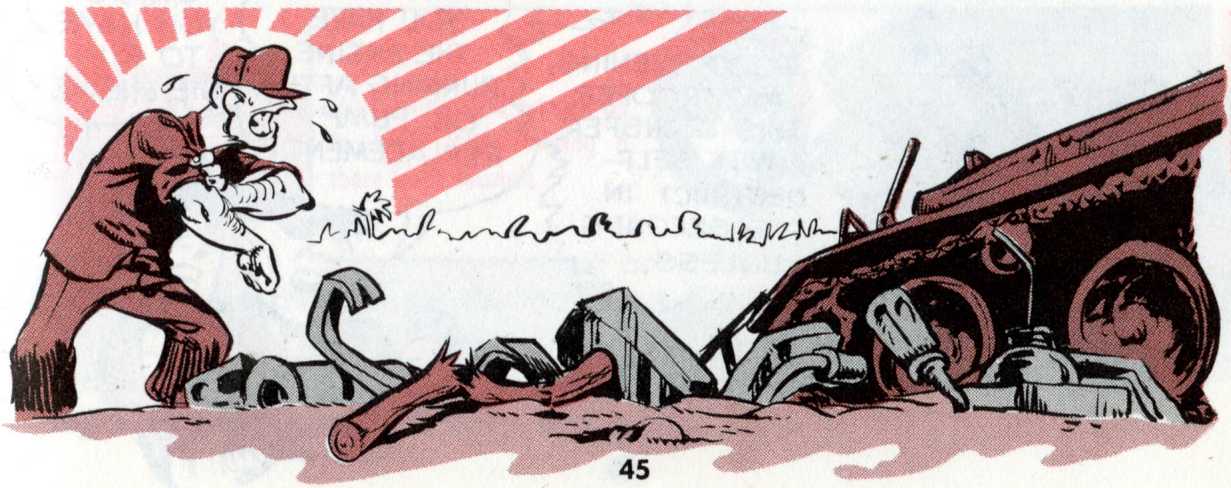
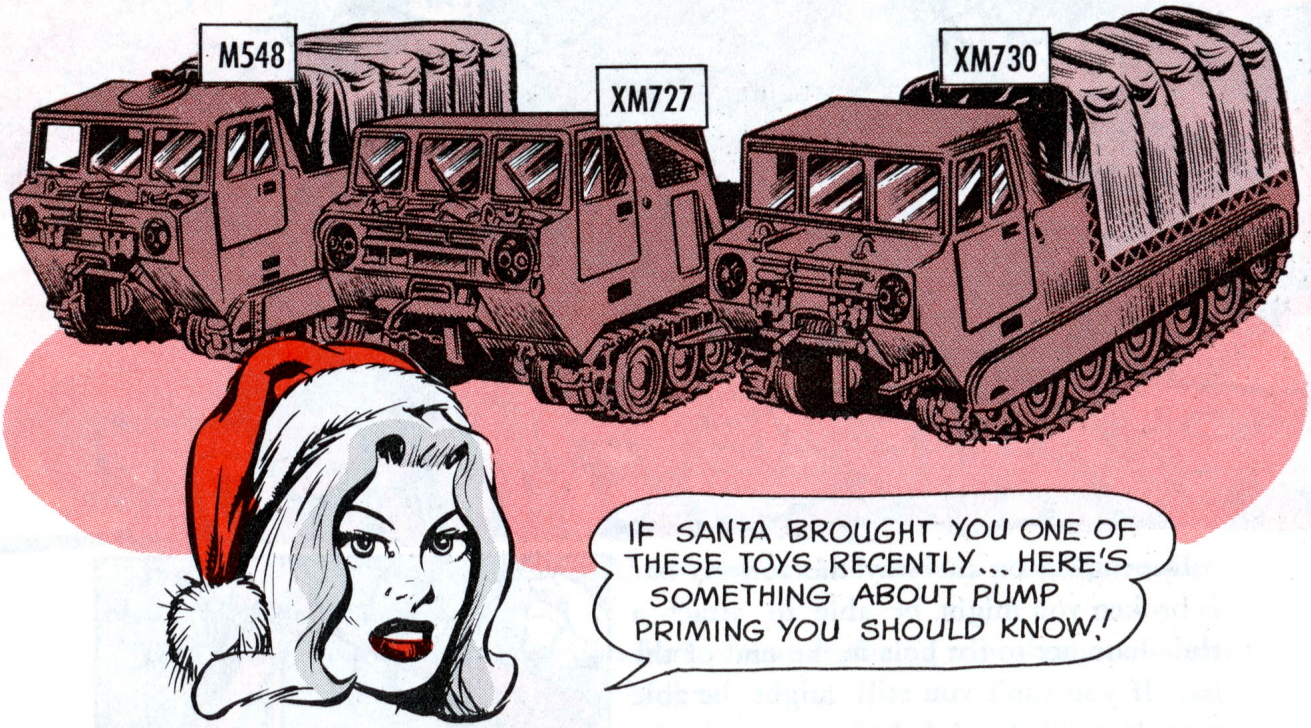


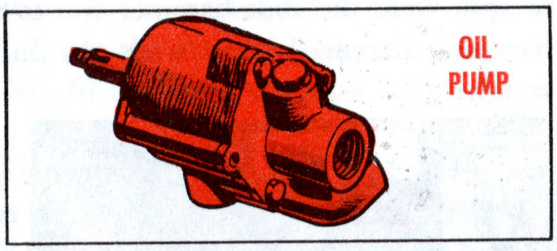
TO PRELUBE YOUR TRANSFER...

TRY A PUMP-PRIMING PROGRAM



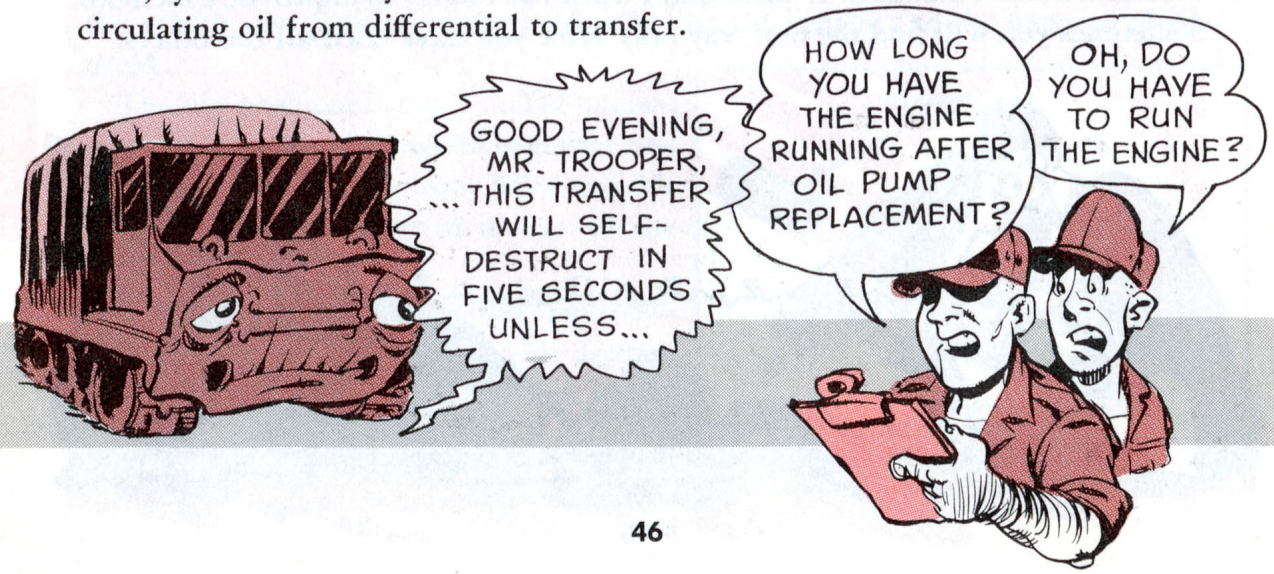
Yep!. Like every ol' country boy knows, when you break in a new pump you have to prime it.

This goes for the M548 6-ton cargo carrier, and the XM727 and XM730 missile carriers.



When you replace the differential oil pump (FSN 2520-903-0281) on any of these 3 vehicles it won't start pumping oil until the engine has been running at 1500 RPM for 5 seconds.

This don't hurt the pump any but it sure does mess up the transfer gearcase. 'Fact, you can entirely ruin a transfer in the 5 seconds before the pump starts circulating oil from differential to transfer.



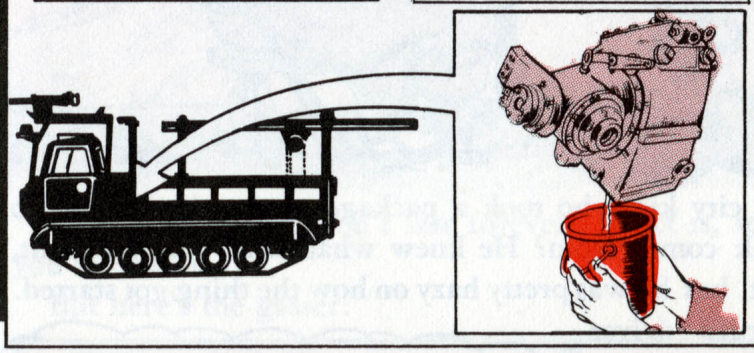
What you need is extra oil in the transfer to protect it during the critical 5 seconds before oil arrives from the differential. You only need this protection once because after the first 1500 RPM 5-second run the pump starts moving oil as soon as you start the engine.

Here's how you protect the transfer:

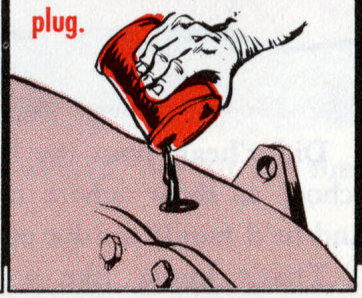
IF DIFFERENTIAL IS ALREADY FULL OF OIL —

Unscrew differential drain plug FSN 4730-737-6357.

Drain off about 2 quarts of oil into a clean container. Replace drain plug.

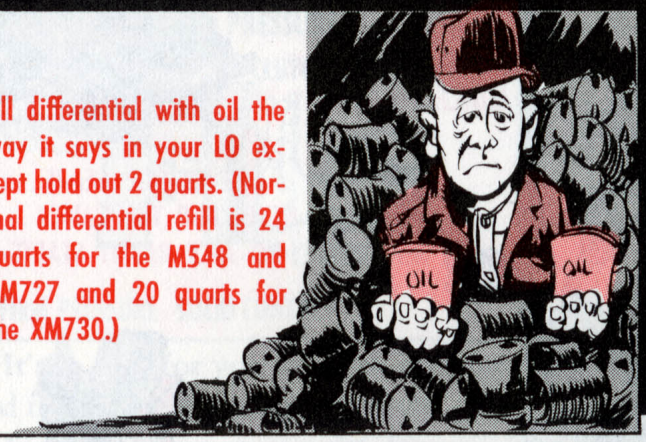


Unscrew plug FSN 4730-542-4173 from top of transfer case, pour in the 2 quarts of oil and screw back the plug.



IF DIFFERENTIAL HAS BEEN DRAINED —

Fill differential with oil the way it says in your LO except hold out 2 quarts. (Normal differential refill is 24 quarts for the M548 and XM727 and 20 quarts for the XM730.)



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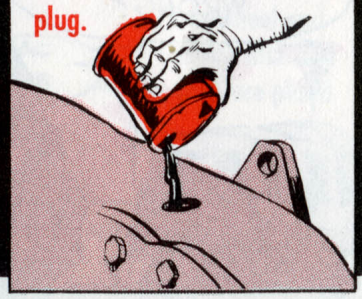
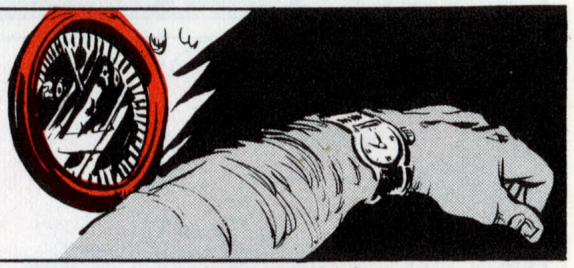
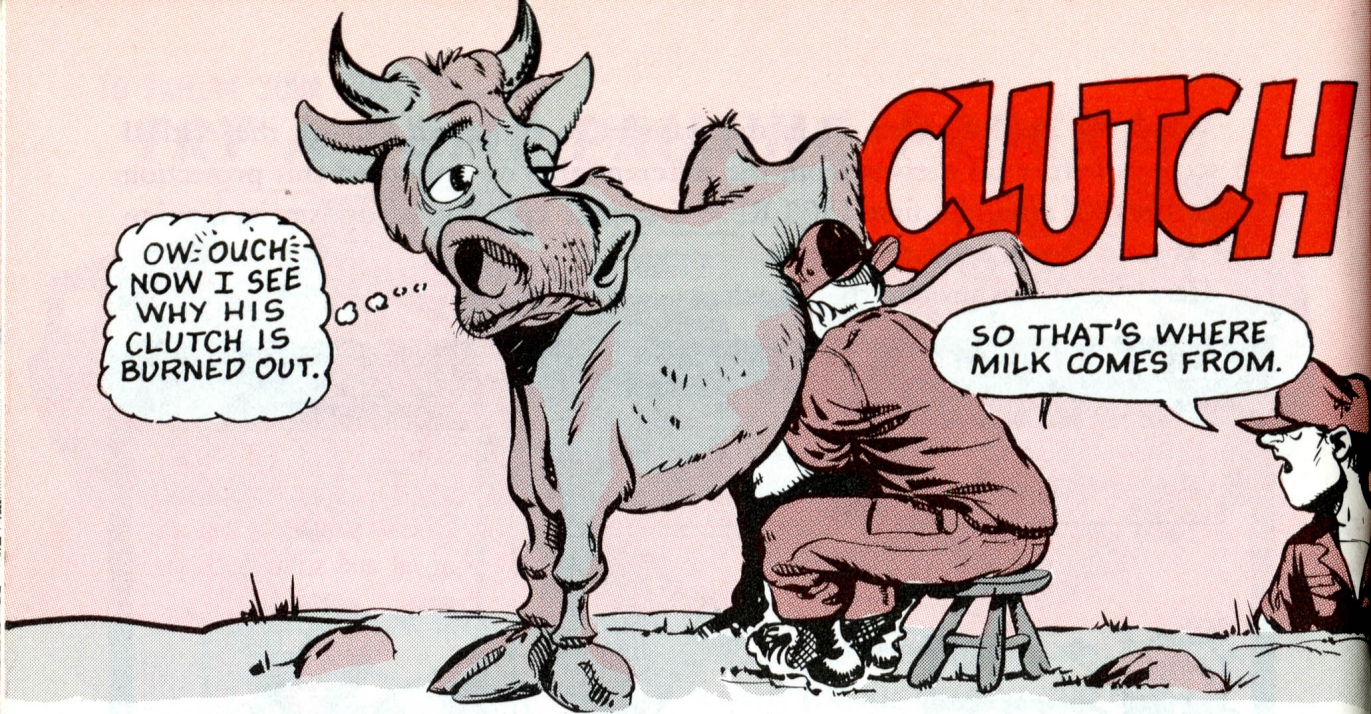


AFTER EITHER OPERATION

Start engine and bring it up to 1500 RPM, holding it there for 5 seconds.

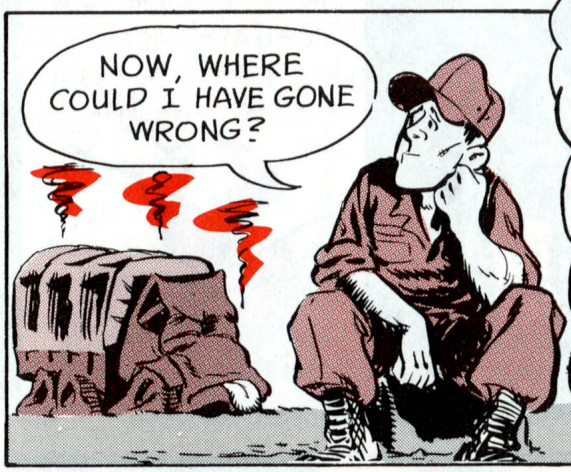


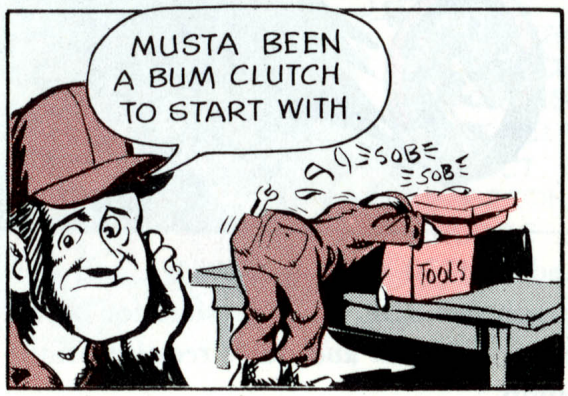
It's only on transfers for the M548 and XM730 (P/N 10949816) and the XM727 (P/N 11598463) that you go through this drill. The transfers for other members of the M113/M113A1 families are different and don't require priming when you put in a new differential pump.

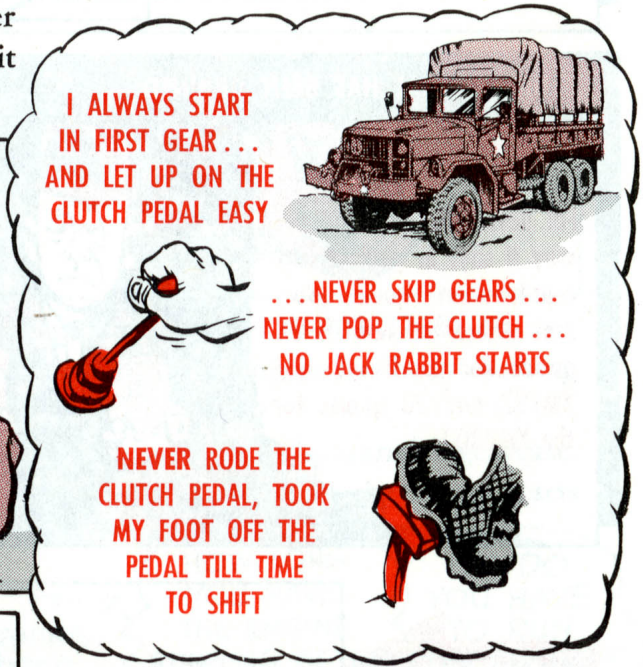


Did y'hear 'bout the li'l city kid who took a package of powdered milk to school to show where milk comes from? He knew what milk was, all right, and he'd handled a lot of it, but he was pretty hazy on how the thing got started.

That's kinda like a truck driver whose clutch poops out sooner'n it ought to.

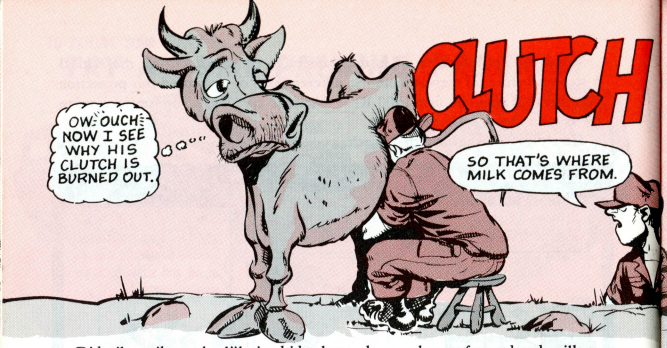






This driver doesn't go back to the real beginning — where his clutch trouble really started. Like when he should've kept close tabs on his clutch pedal free travel — when he could've hollered for a mechanic to adjust his clutch — when his clutch still had a chance for a long 'n' happy life.

CLUTCH ES 'N' COWS



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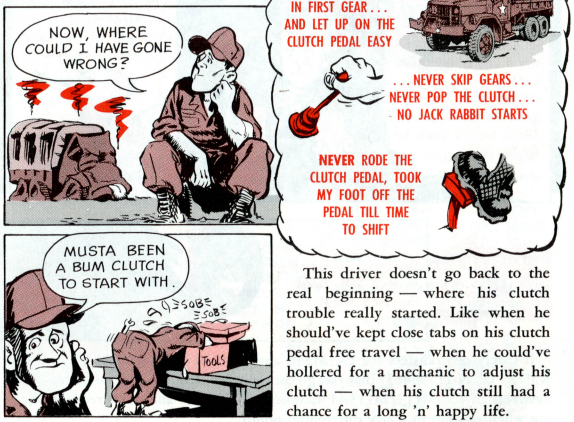

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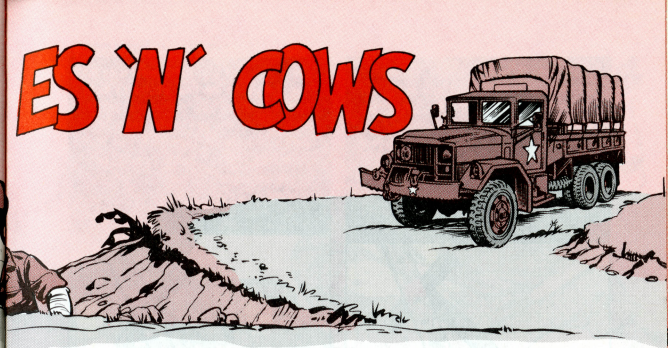
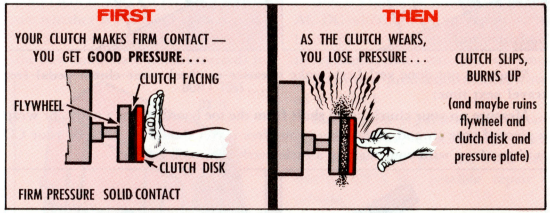


Sure, your clutch won't last forever — fact is, it's wearin' out all the time you're usin' it.

But here's the gasser:



It's so easy for you to check on your clutch adjustment — no muss, no fuss — and it takes only a coupla seconds.

First, to get set up, get the dope on your clutch pedal free travel from the -20 TM on your vehicle.

	Clutch pedal free travel must be no less than
¼-ton (M151A1 etc.) — TM 9-2320-218-20 (Aug 68), para 2-44	1⅛ inches
¾-ton (M37B1 etc.) — TM 9-8030 (May 55), para 187	1 inch
1¼-ton (M715 etc.) — TM 9-2320-244-20 (Oct 68), para 02-4c	¾ inch
2½-ton (M35A2 etc.) — TM 9-2320-209-20 (Apr 65), para 150a	1½ inches
5-ton (M54A2 etc.) — TM 9-2320-211-20 (Mar 63), para 158a	2 inches
10-ton (M125 etc.) — TM 9-2320-206-20 (Apr 66), para 2-69a	1 inch

PS MORE

ES 'N' COWS

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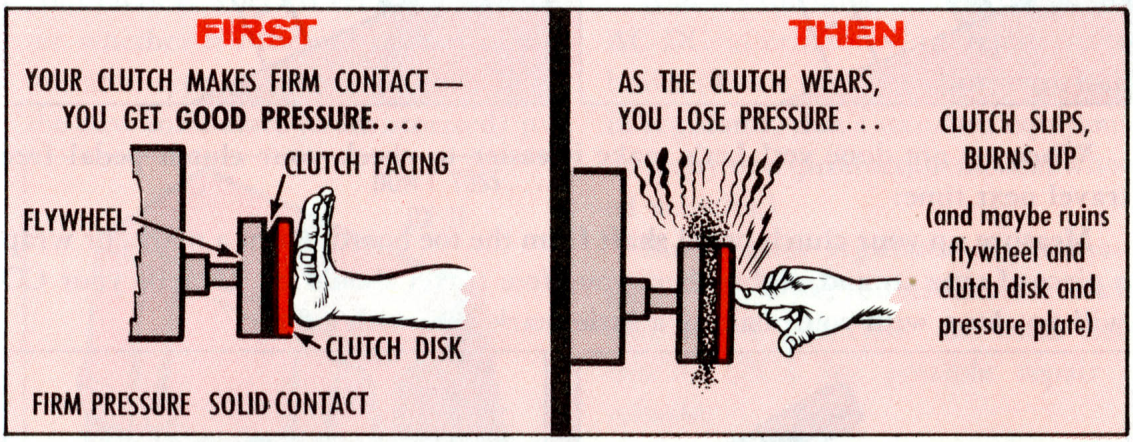

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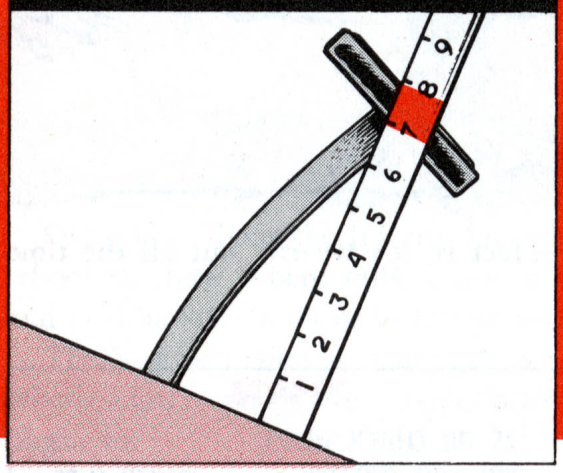
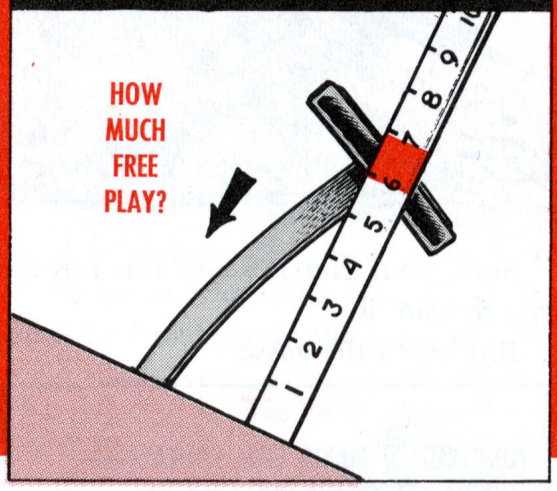
3/4-ton (M37B1 etc.) — TM 9-8030 (May 55), para 187	1 inch
1 1/4-ton (M715 etc.) — TM 9-2320-244-20 (Oct 68), para 02-4c	3/4 inch
2 1/2-ton (M35A2 etc.) — TM 9-2320-209-20 (Apr 65), para 150a	1 1/2 inches
5-ton (M54A2 etc.) — TM 9-2320-211-20 (Mar 63), para 158a	2 inches
10-ton (M125 etc.) — TM 9-2320-206-20 (Apr 66), para 2-69a	1 inch

PS MORE

Now take a ruler or a tape and hold it alongside your clutch pedal with one end of your ruler resting on the toe board. See where your clutch pedal comes on the ruler. Push down on the clutch pedal with your hand. It'll go down easy at first. Then, all at once, you'll feel pretty hard pressure. This's where your clutch starts to disengage — starts to pull away from your flywheel. That's the end of your free travel.

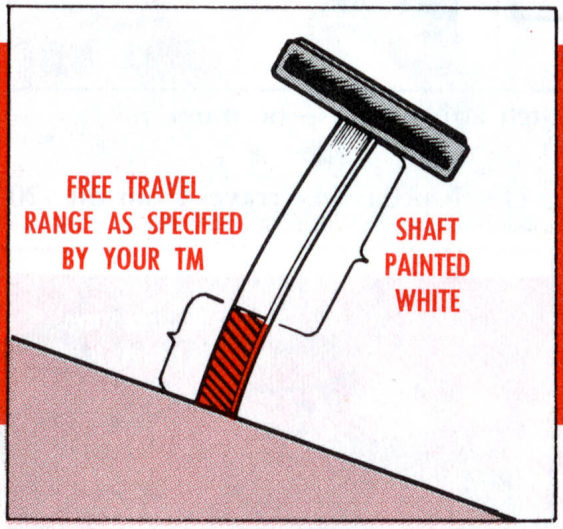


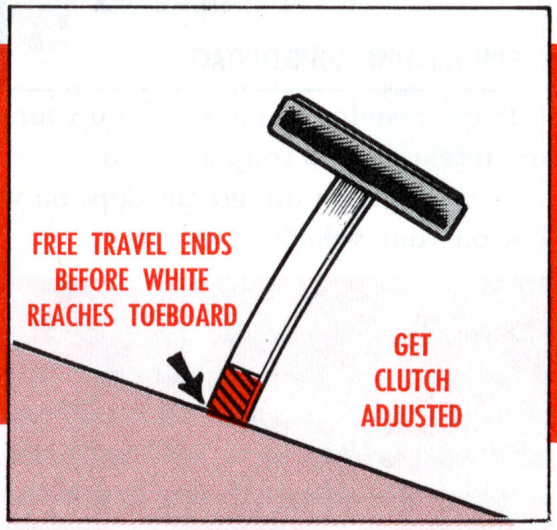
Now see where your clutch pedal is on the ruler. If it's gone less than whatever's right for your vehicle, your clutch needs adjustment. Get this info on your DA Form 2404 (and also on the DA Form 2408-1 in your logbook) so your unit mechanic can get right the job and adjust your clutch.



Whoa — not done yet! Let's make it easier to check your clutch pedal free travel next time:

Measure up your clutch pedal shaft from the toe board. Paint a mark, or wrap a piece of tape around, right where your free travel should be. (Maybe your CO will go along with your making a little mark here with a file.)



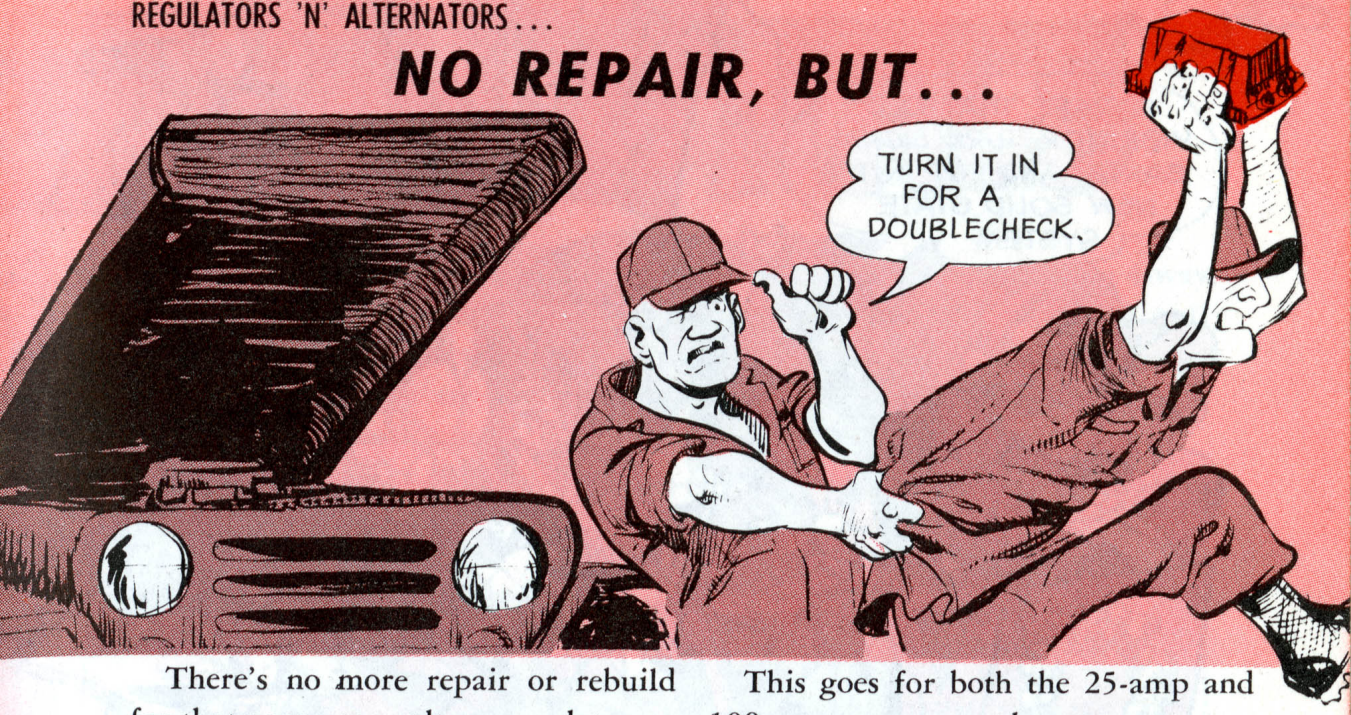


Now, before you start up your truck, you just press down on your clutch pedal and see how you're sittin' on free travel.

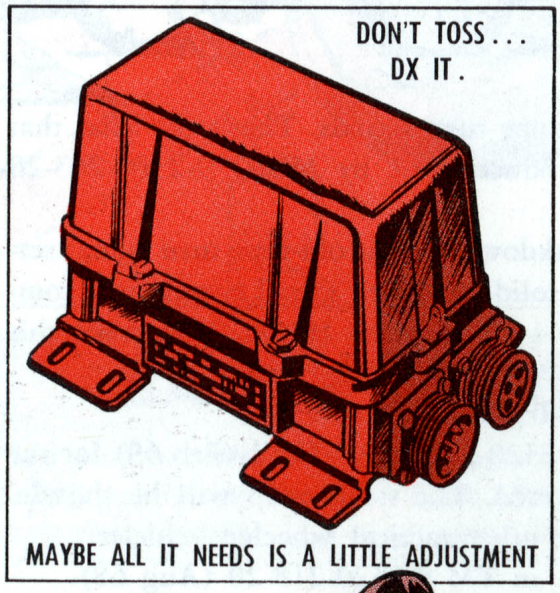
That's what you call gettin' milk at the cow.

REGULATORS 'N' ALTERNATORS . . .

NO REPAIR, BUT . . .



There's no more repair or rebuild for that generator voltage regulator on your tactical wheeled vehicle — no matter whether it's the old carbon pile or vibrator type regulator or even if it's the new solid-state (transistorized) job.

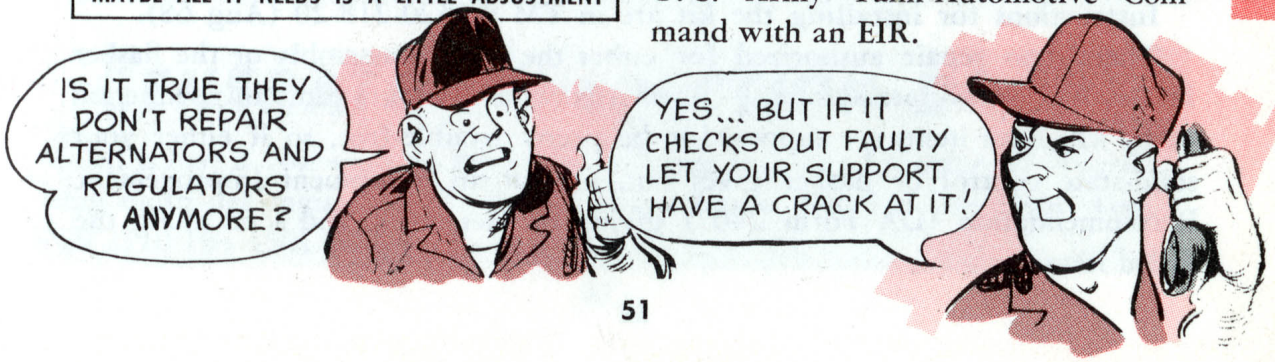


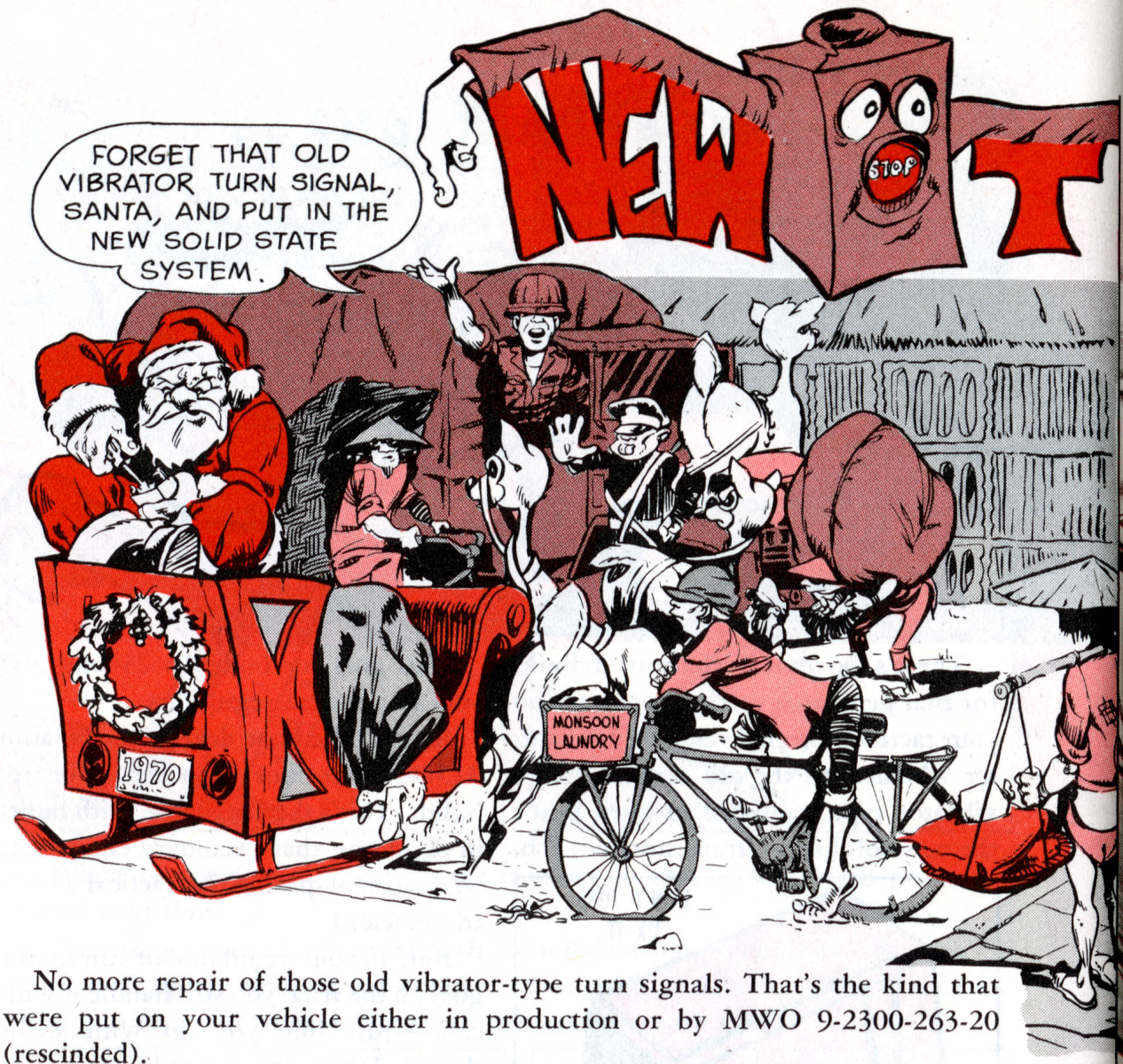
This goes for both the 25-amp and 100-amp system regulators.

And it's the same deal on the 60-amp AC-DC alternator — no repair or rebuild. (This's the alternator, with built-in regulator, that's standard equipment on many new-production tactical wheeled vehicles.)

But, if your regulator or alternator goes on the fritz, you still handle it with care — just like you do with items that're DX'd for possible repair or rebuild.

Your support wants your bum regulator or alternator. They'll check it out. Maybe it's just a li'l sick and can be put back on the road with adjustment or cleaning. If it's one of the 100-amp solid-state jobs, they'll send it to the U. S. Army Tank-Automotive Command with an EIR.





No more repair of those old vibrator-type turn signals. That's the kind that were put on your vehicle either in production or by MWO 9-2300-263-20 (rescinded).

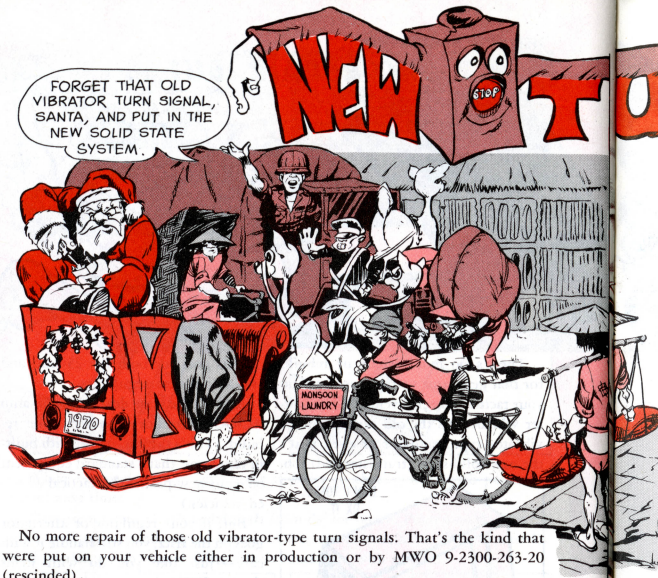
From now on, when you've got a breakdown in that old-type turn signal set-up, you replace the whole deal with the solid-state turn signal system now coming out on new-production vehicles — 1/4-ton through 10-ton. You make this switch with:

Kit, solid-state turn signal, FSN 2590-050-8821.

The kit and repair parts are in TM 9-2320-218-20P w/ch 1 (Feb 69) for the G838-series 1/4-ton vehicles (M151A1 etc.). The same poop will be showin' up in -20P TM changes or revisions for other tactical wheeled vehicles.

Instructions for installing the kit are in TM 9-2320-218-20 (Aug 68).

There's no repair authorized for either the control assembly or the flasher in this new solid-state system — no matter whether yours came in production or by kit. Both items are supposed to be pretty trouble-free, so if either your solid-state control or flasher gives out, fire off an Equipment Improvement Recommendation (DA Form 2407) giving the details — and send along the failed item.



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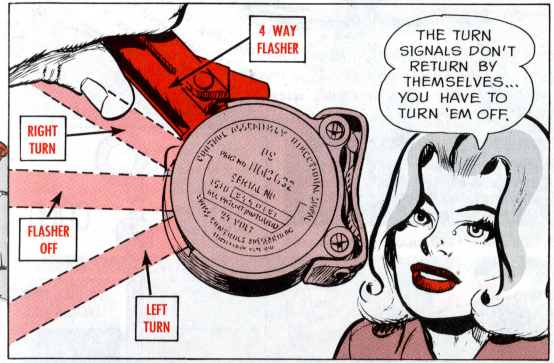

BATTERIES FOR FLASHER

You need batteries if you get Warning Light, Flasher, Portable, FSN 6220-796-2657, authorized by TB 9-2300-260-10 (May 65). So order 2 of Battery, FSN 6135-050-3280, listed in SC 6135/40-IL (Jan 67).

GENERATOR INSPECTION DOOR

Call it that if you want to, but when ordering this part for your G744-series 5-ton multifuel engine truck, ask for: Right Fender Panel Access Door Assy, FSN 2510-104-4501 (RIC is S9C).

URN SIGNALS

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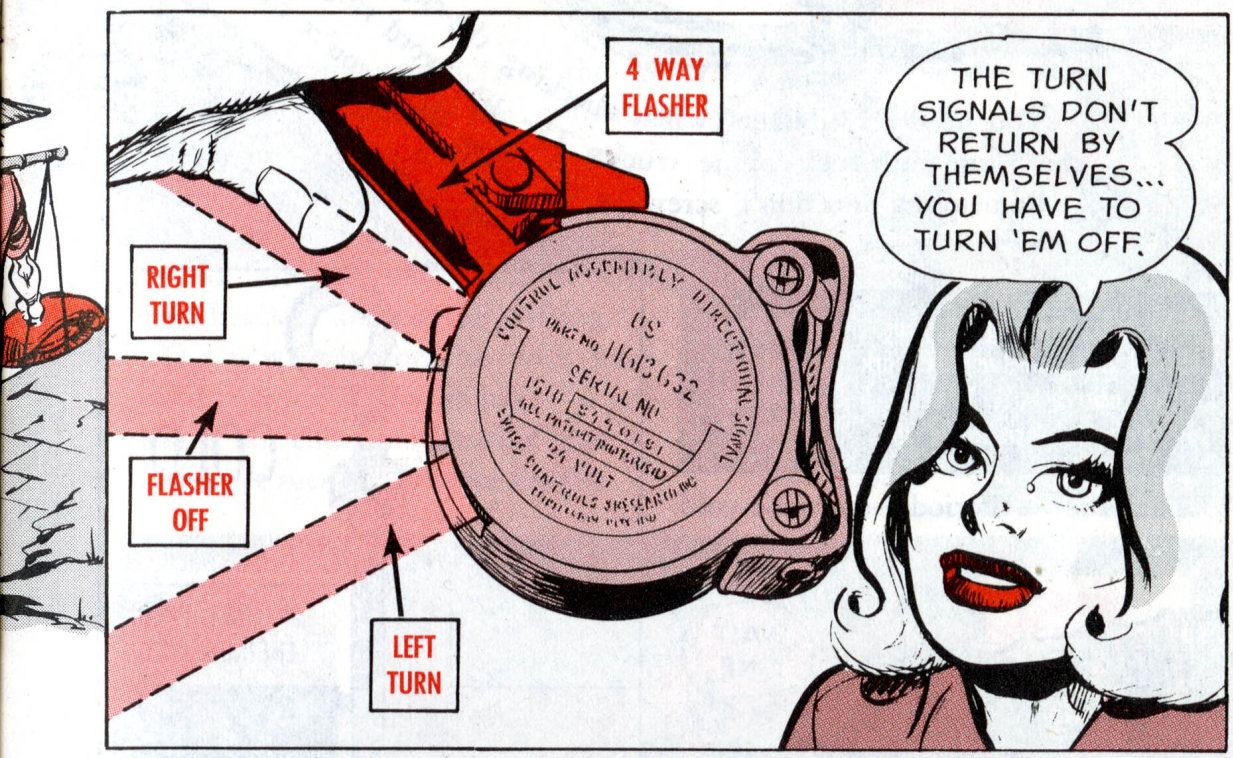

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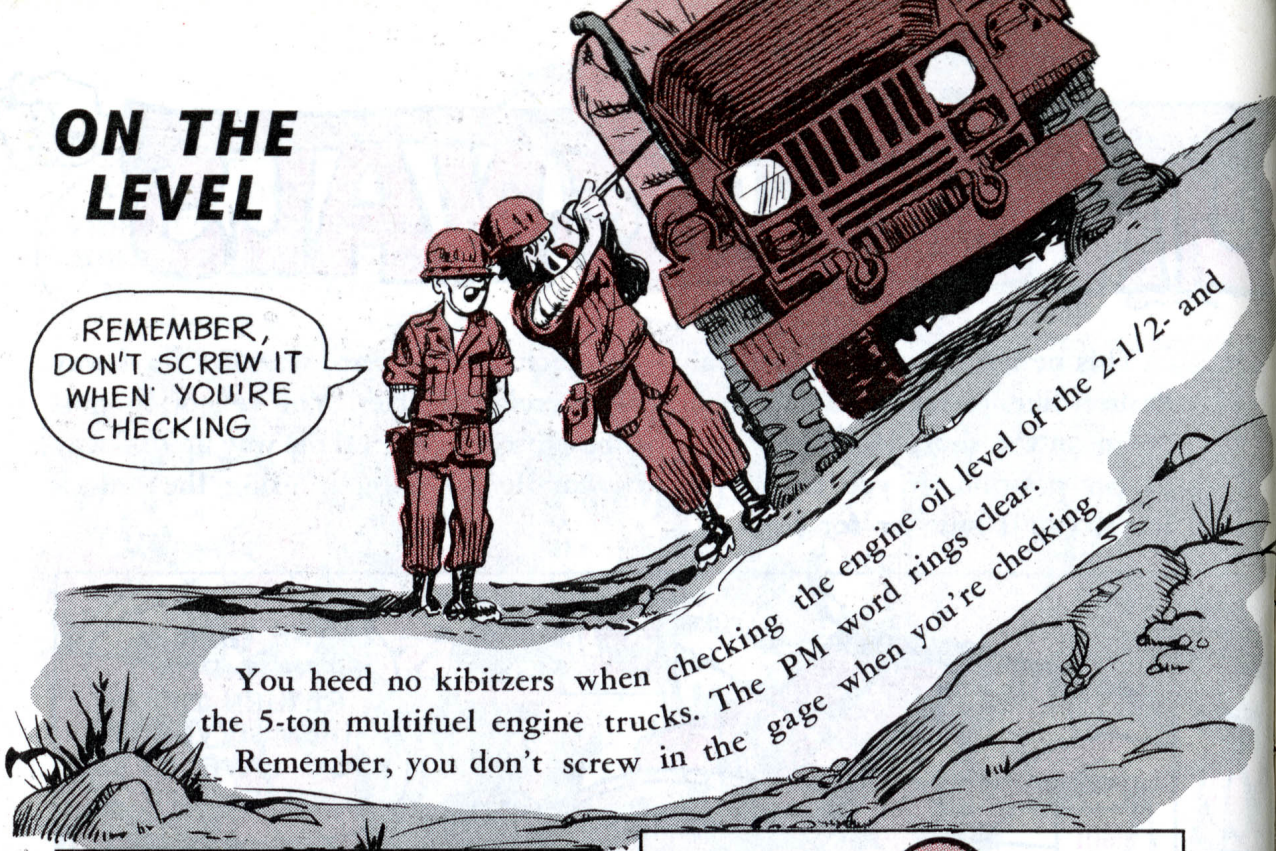
ON THE LEVEL



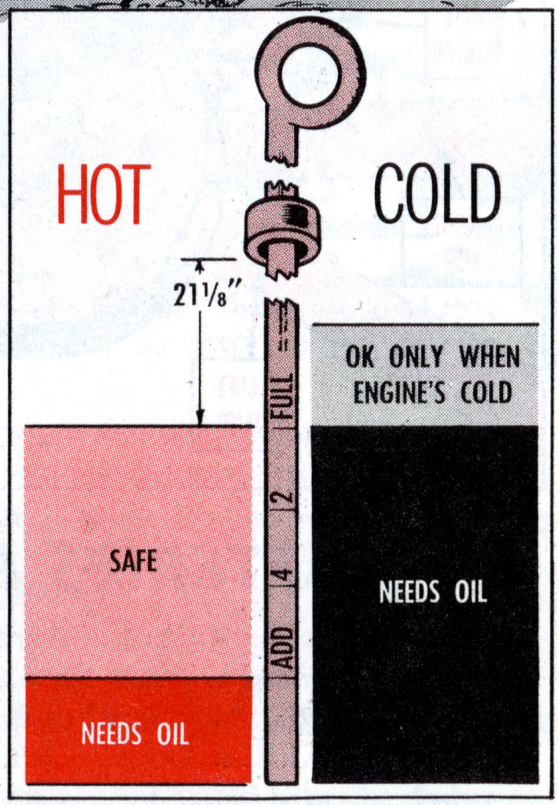
You heed no kibitzers when checking the engine oil level of the 2-1/2- and the 5-ton multifuel engine trucks. The PM word rings clear. Remember, you don't screw in the gage when you're checking.

With a cold engine, your oil level gage should read from the FULL mark to about 1½ inches above FULL. If below FULL, you add oil to about 1 inch above FULL.

That's it — Period — on the cold engine.

After you warm up the engine or after operating the truck, you're smart to toe the mark too.

1. Stop engine.
2. Read your oil level one minute after stopping.
3. Oil level should be between ADD and FULL.



Natch, you can't click with the dipstick if you don't have the right one.

The new gage, FSN 6680-887-1334, has the FULL mark at 21-1/8 inches from the bottom of the screw cap.

SOLID FRONT ENGINE MOUNT . . .

BOLT OF MAGIC

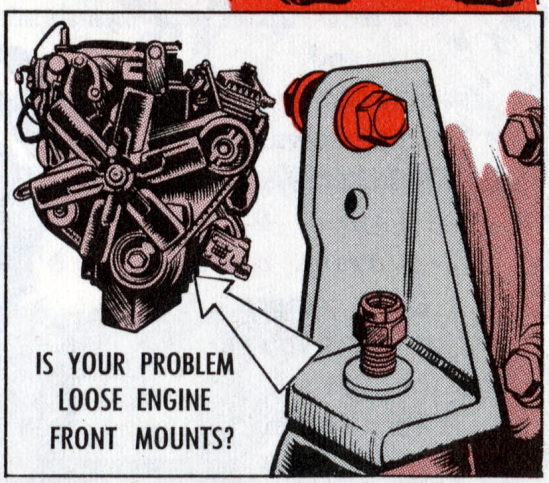
Presto!

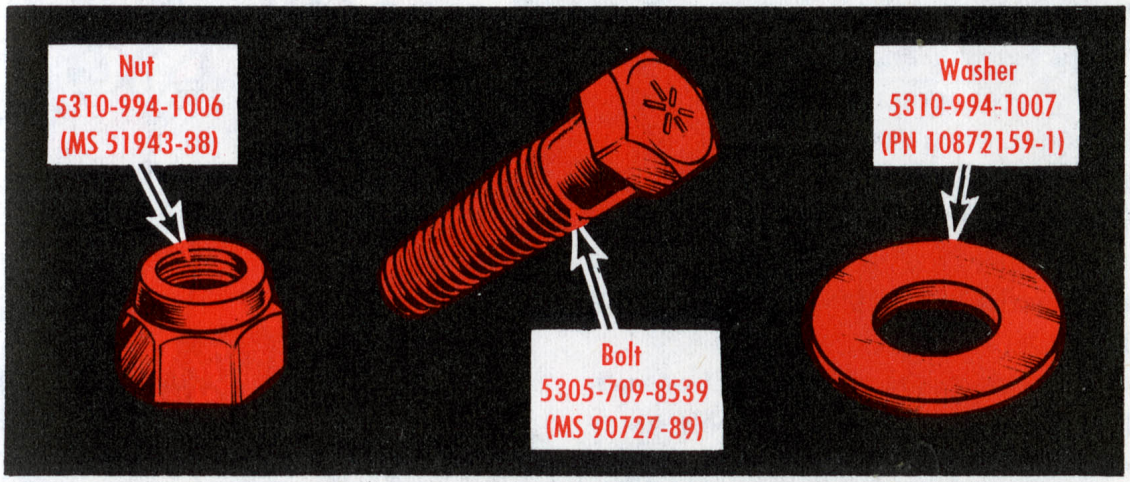
Your troubles vanish from the engine front mounts of the multifuel G742-series 2-1/2-ton trucks. A tough Grade 8 bolt does the trick.

You put it on and you no longer see cracked injector pumps, busted bolts, shaky brackets and engine shifting.

The new bolt goes on with hard-boiled partners to do the job — a self-locking nut and a hardened washer.

You get them with these FSN's:





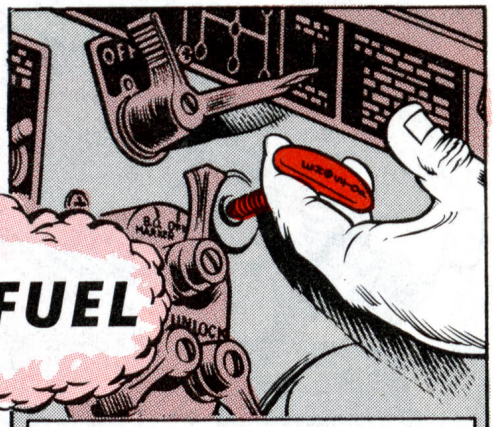
The parts are so rugged you have to use the new washer to protect the mounting bracket from the bolt itself. It's an extra-strong washer for the bolt head. You use the "old" washer for the nut end.

When you got them all in their positions, torque to 75-80 ft-lbs.

New trucks now get the strong bolt right on the assembly line.

You can't lose with it.

HOLD THAT MULTIFUEL



YOU NEED THIS . . .

ENG STOP WITH RATCHET

You ever see a truck up and take off on its own? It's crazy, man, crazy. It can happen to you if you've got a 2 1/2-ton multifuel without the rachet-type engine stop.

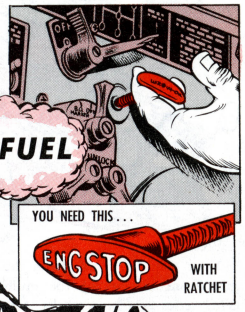
Yep, you gotta have the one that stays out when you pull it out, like it says in Article 85 of TB 750-981-4 (Oct 68).

You get the positive-lock engine stop with FSN 2990-077-1940 (PN 10872080-2).

Early multifuel models with no such lock have been known to bolt away without a driver.

EVEN WITH THE **NEW** STOP CONTROL... PARK YOUR MULTIFUEL WITH THE TRANSMISSION IN **NEUTRAL** AND PARKING BRAKE **ON!**

HOLD THAT MULTIFUEL



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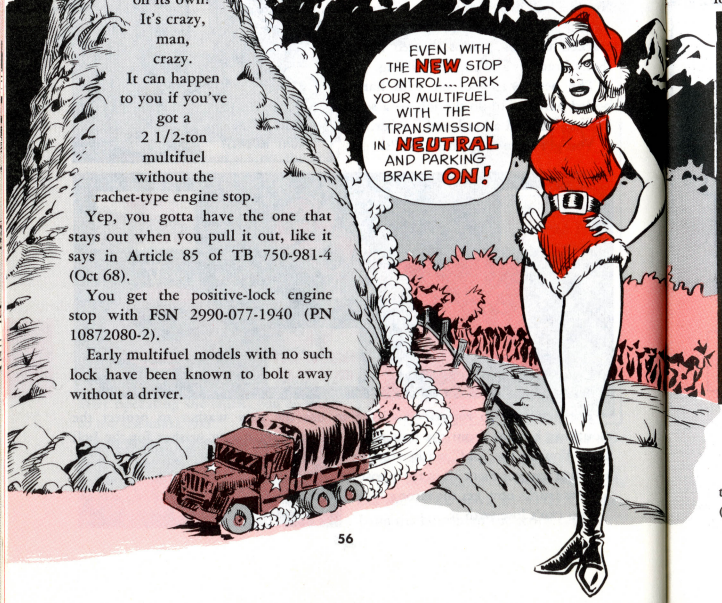
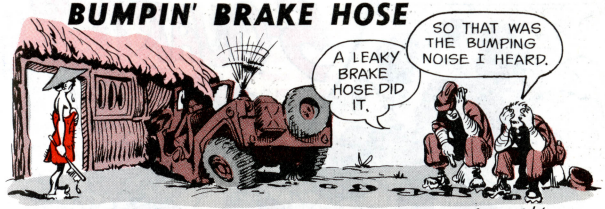


BUMPIN' BRAKE HOSE

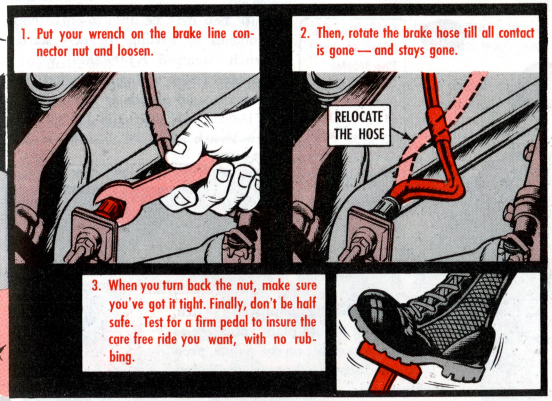


You can't afford a brake hose smackin' a suspension arm on any of your 1/4-ton trucks.

In no time, the brake hose will wear through and leak fluid.

It'll pay to check all your M151 series.

You've got troubles if you see one restin' on a suspension arm, expecially a lower front one.



LATEST 1¼-TON PLUG

Now, you can get a clean-burning, field-tested spark plug for your 1 1/4-ton trucks. FSN 2920-134-7643 (PN 70040-WR44LS) will get it for your M715 (cargo), M725 (ambulance) and M726 (telephone maintenance).

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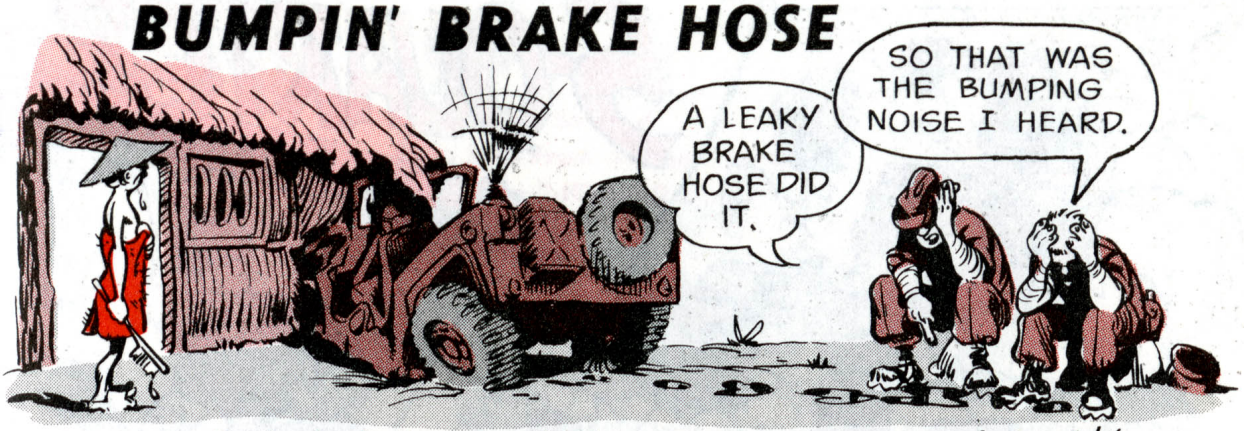

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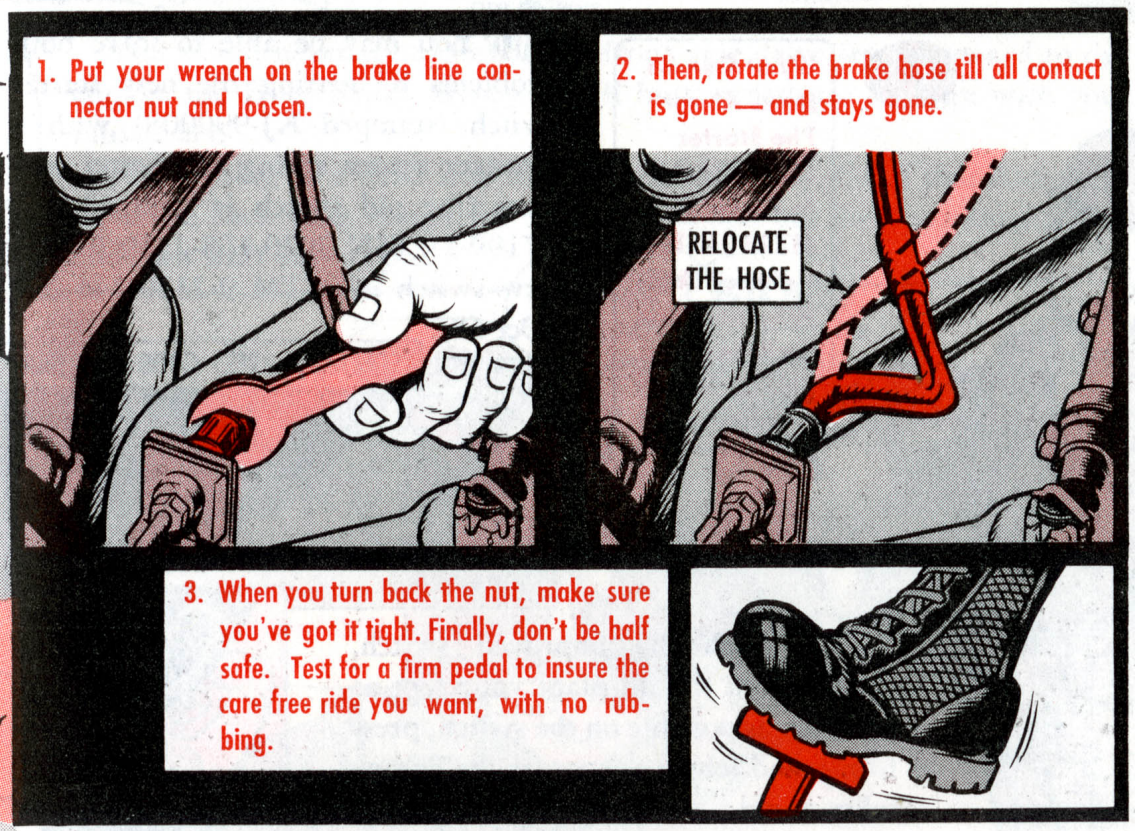

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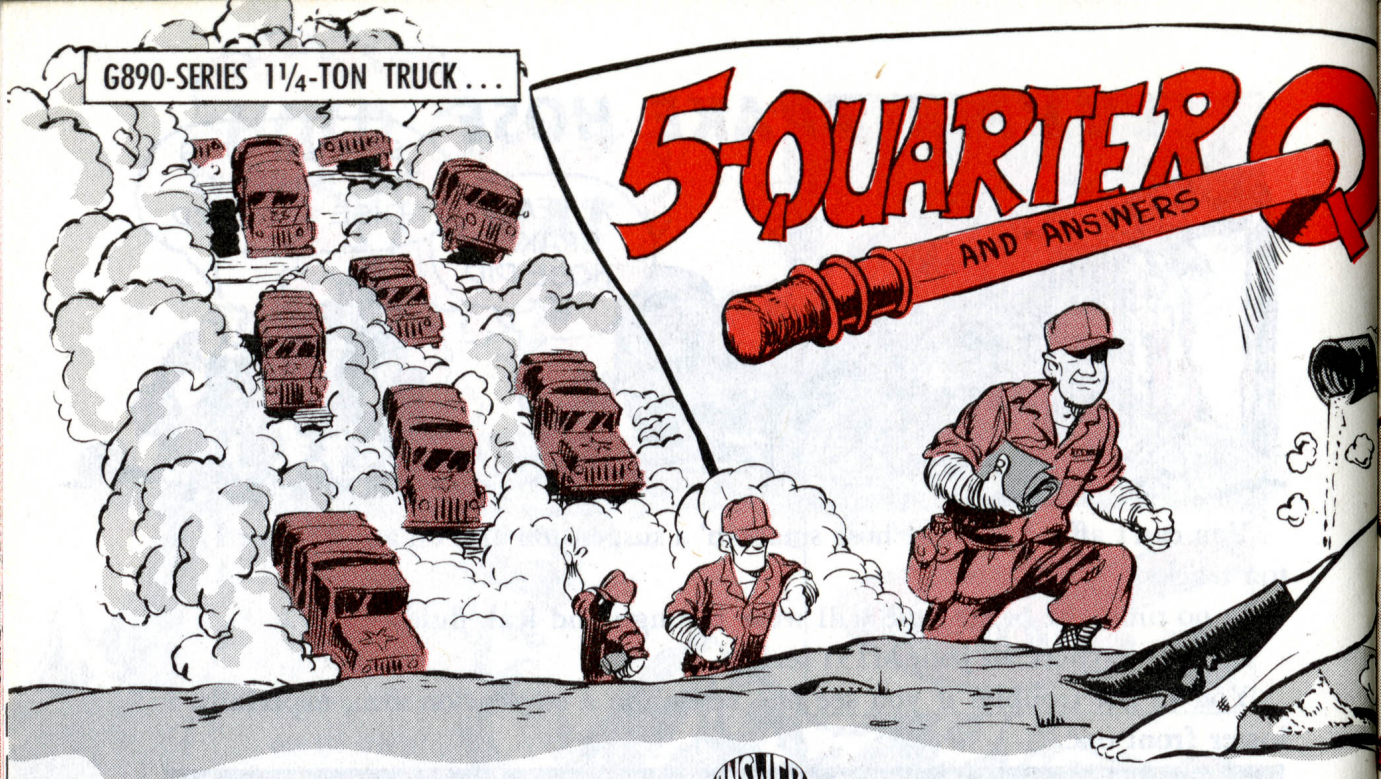
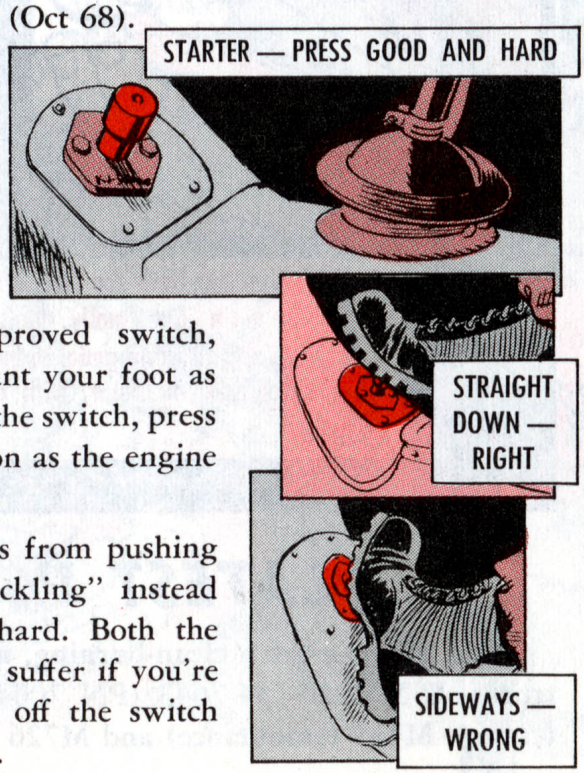


QUESTION

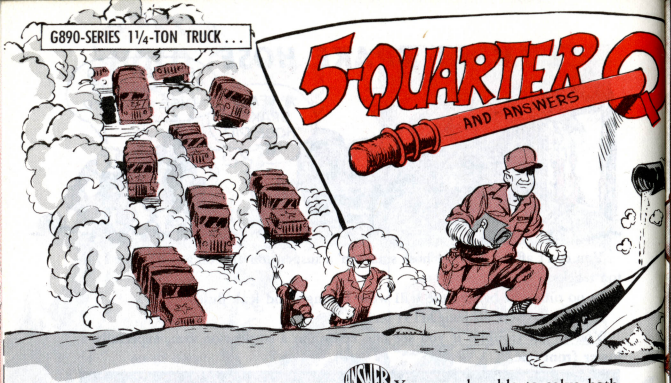
What Can Be Done About The Starter Switch Sticking In an M715 or M725 1¼-Ton Vehicle? And Why do Some Switches Burn Out so Soon ?

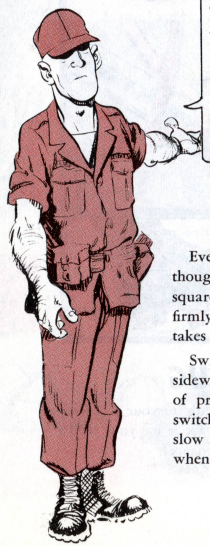
ANSWER You may be able to solve both problems by getting the new starter switch (stamped KJ-990008) with a stronger return spring and better contacts (the old switch is stamped MS-27199-1). FSN 2920-168-2339 for the new switch is in TM 9-2320-244-20P (Oct 68).



Even with the improved switch, though, you should plant your foot as squarely as possible on the switch, press firmly and let up as soon as the engine takes ahold.

Switch trouble comes from pushing sideways and from "tickling" instead of pressing good 'n' hard. Both the switch and starter will suffer if you're slow gettin' your foot off the switch when the engine starts.





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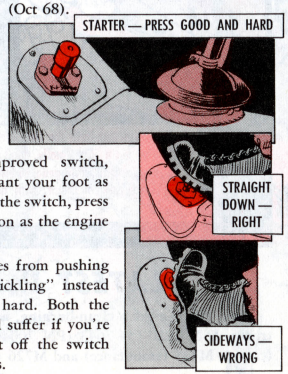

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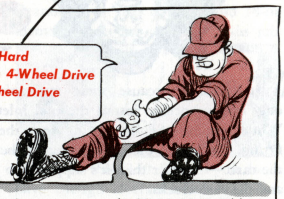
Why is it So Hard To Shift From 4-Wheel Drive Back To 2-Wheel Drive Sometimes?



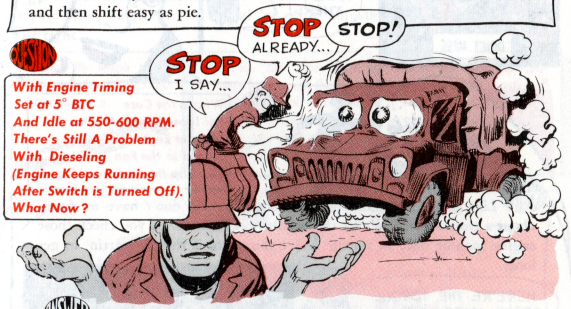
ANSWER Like it says on page 40, TM 9-2320-244-10 (Aug 68), this's caused by "buildup of torsional stress in the drive train." Although this binding usually comes from driving on a hard surfaced road in 4-wheel drive, a lot of guys don't realize the same thing may happen in cross-country operation.

You never, never try to force your front axle drive lever forward to disengage the front wheel drive—you'll bust something for sure with your muscle act.

Just coming to a dead stop may let you shift easy. Or, if that doesn't do the trick, back your vehicle for a few feet to take out that "torsional stress" and then shift easy as pie.

QUESTION

With Engine Timing Set at 5° BTC And Idle at 550-600 RPM. There's Still A Problem With Dieseling (Engine Keeps Running After Switch is Turned Off). What Now ?



ANSWER If — and only if — that timing and idle don't stop your dieseling, try resetting the idle at 500 RPM. If resetting your idle still doesn't stop the dieseling, then — and only then — reset your timing at 2° or 3° BTC (this change in timing may result in your engine losing a little of its poop).

PS MORE

UESTIONS

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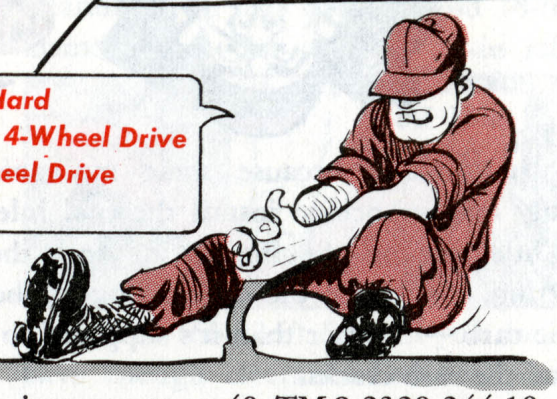

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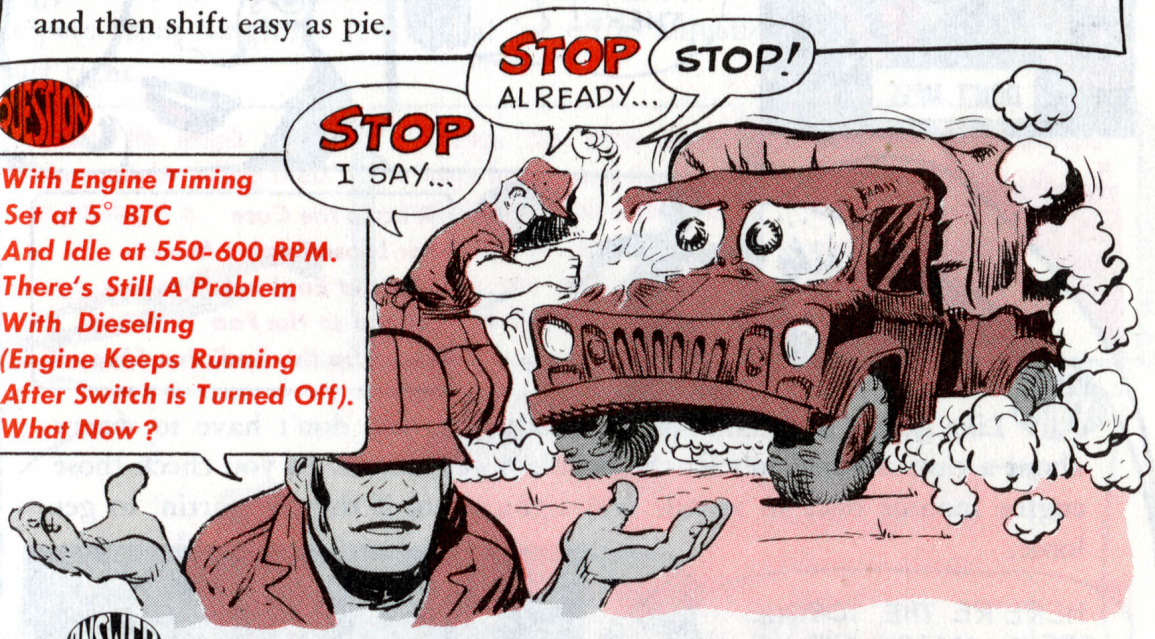

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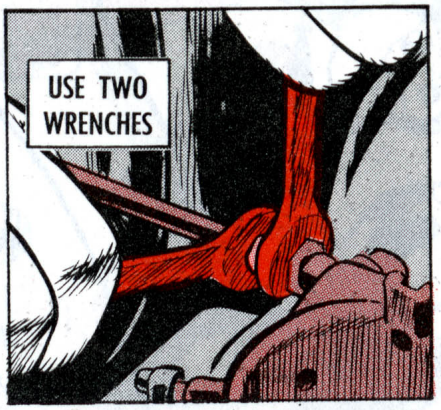
P.S MORE

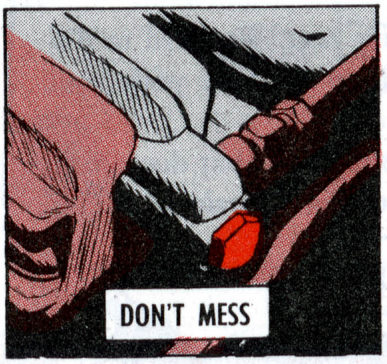
QUESTION ***Why do so Many Carburetors Crack at the Fuel Inlet Fitting?***

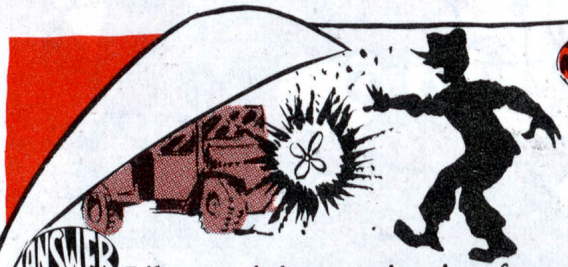
ANSWER Probably because some mechanics use only one wrench to install the fuel inlet line. While turning the line fitting into the carb fitting, they force the carb fitting farther into the carb — farther than it's supposed to go — and the carb cracks.

You've got to use 2 wrenches — one to hold the carb fitting still and the other to turn the line fitting.

And no messin' around with that carburetor fuel-inlet-needle-and-seat-assembly. That's for support only.

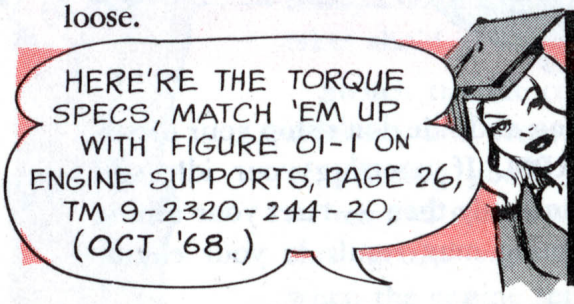






QUESTION ***What's the Cure For Loose Engine Mounts That Let Engine Lunge Ahead so the Fan Tears up the Radiator Shroud?***

ANSWER Like gettin' a vaccination for small pox, you don't have to worry about a cure if you don't let the problem get started. So you check those engine mounts once in awhile and tighten 'em if they're startin' to get loose.

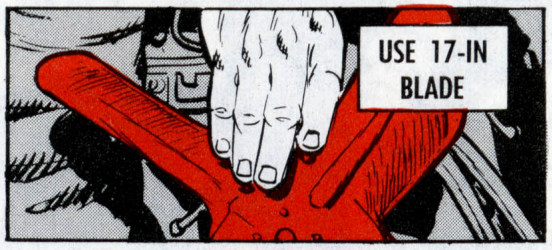


1	Engine adapter bracket	15-20 lb ft
2	Rubber insulator	18-30 lb ft
3	Frame side rail brackets	25-30 lb ft
4	Torque reaction arm insulator	15-20 lb ft
5	Torque reaction support arm	18-30 lb ft
7	Rebound pad	18-30 lb ft
8	Rear insulator assembly	15-20 lb ft

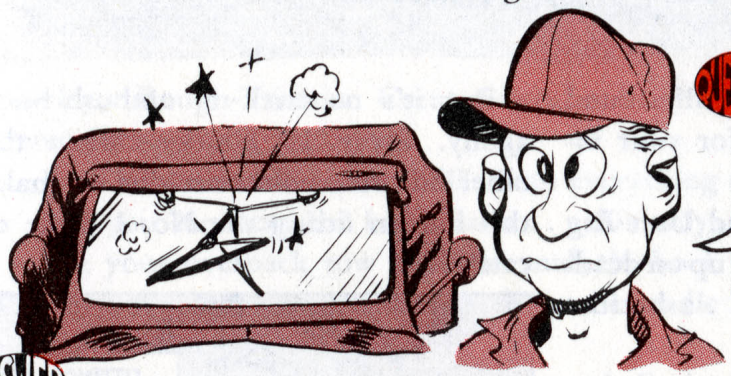
And check the rubber insulators, like it says in para 01-2 of your -20 TM.

Make sure these insulators have still got bounce — so they work like a cushion to soak up engine movement. If your insulators have gone dead — no bounce — or if the layers are comin' apart, you need new insulators.

There has to be a little movement of the engine, so check your radiator shroud to see that the fan clears it by at least an inch. If there's not enough clearance, you may have the old 18-in diameter fan. Get the new 17-in job



FSN 2930-168-2340. Then if you don't have enough clearance between your fan and the radiator shroud, you'll have to trim a little off the shroud.



QUESTION

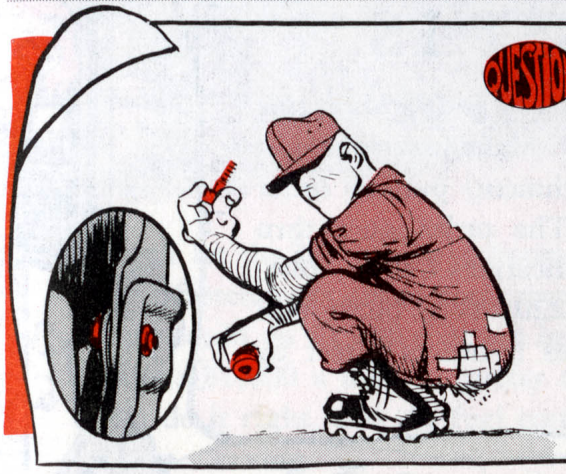
Is There Any Way To Keep the Windshield Wipers From Hitting Each Other And Hanging Up?

ANSWER You can adjust 'em any one — or all — of 3 different ways to keep your wipers from tangling. It's a trial 'n' error adjustment — till you get 'em just right.

1. Change the length of the wiper arm by pulling it out or pushing it in.

2. Change the wiper blade angle by loosening the screw on the lower part of the arm, moving the blade to the angle you want and then retightening the screw.

3. Move the whole arm-and-blade-assembly — pull it off the motor shaft, pick a new angle position and shove it back on the shaft.



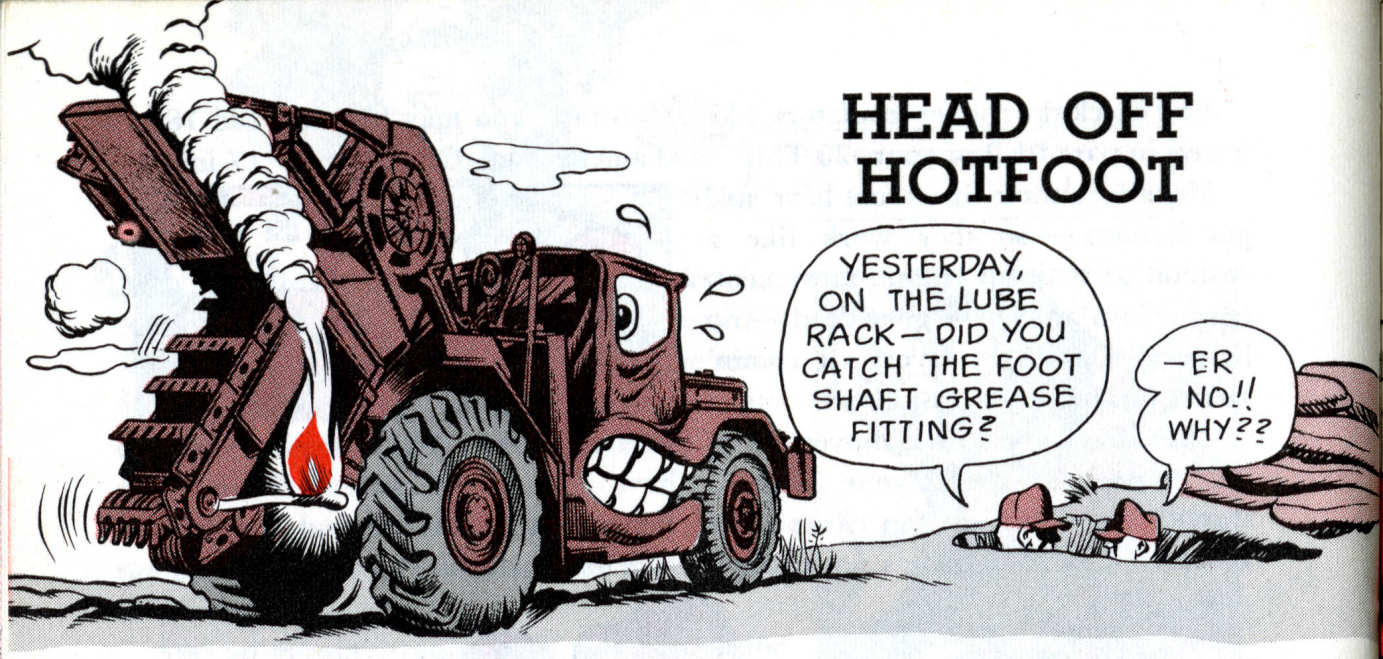
QUESTION

Is There Anything Wrong With Reversing the Seat Bolts 'N' Nuts So the Bolt End Doesn't Gouge And Tear The Side of the Cushion at the Back of The Seat?

ANSWER That's a neat seat saver.

PS END

HEAD OFF HOTFOOT

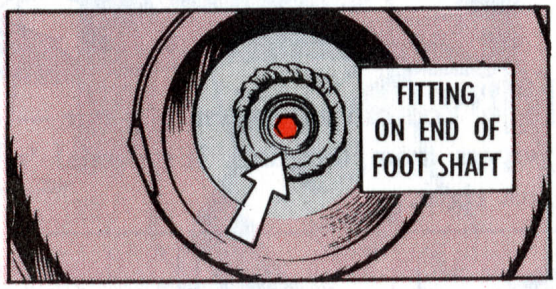


A hotfoot can get a laugh all around sometimes — but not so for your intrenching machine.

Lots of these Parsons and Unit Rig monsters have been turning up on deadline for just that reason . . . a hotfoot on the digging end.

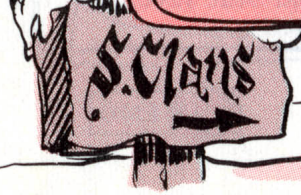
The thing is, lube-rack majordomos forget about the foot shaft and bearing. The grease fitting there's not easy to see because there's a cover plug on it to keep grit out of the lube.

But it's no trick to ambush such agony. Every 10 hours — when the other oil-often points are due — make this hidden fitting the No. 1 place to catch.



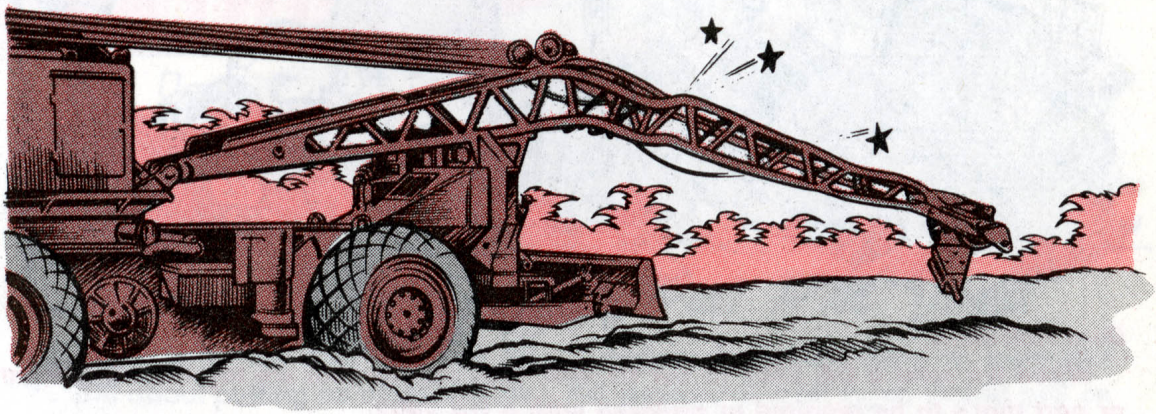
HOW TO GET PS

Many guys ask Connie how they can get PS Magazine every month. There's only one way: Make sure your unit (company, battery, troop or detachment) puts its order in for PS on DA Form 12-4. The order goes thru battalion-level to: U.S. Army Publications Center, 2800 Eastern Blvd, Baltimore, Md. 21220. Your outfit will then receive the number of copies it orders direct by mail every month.



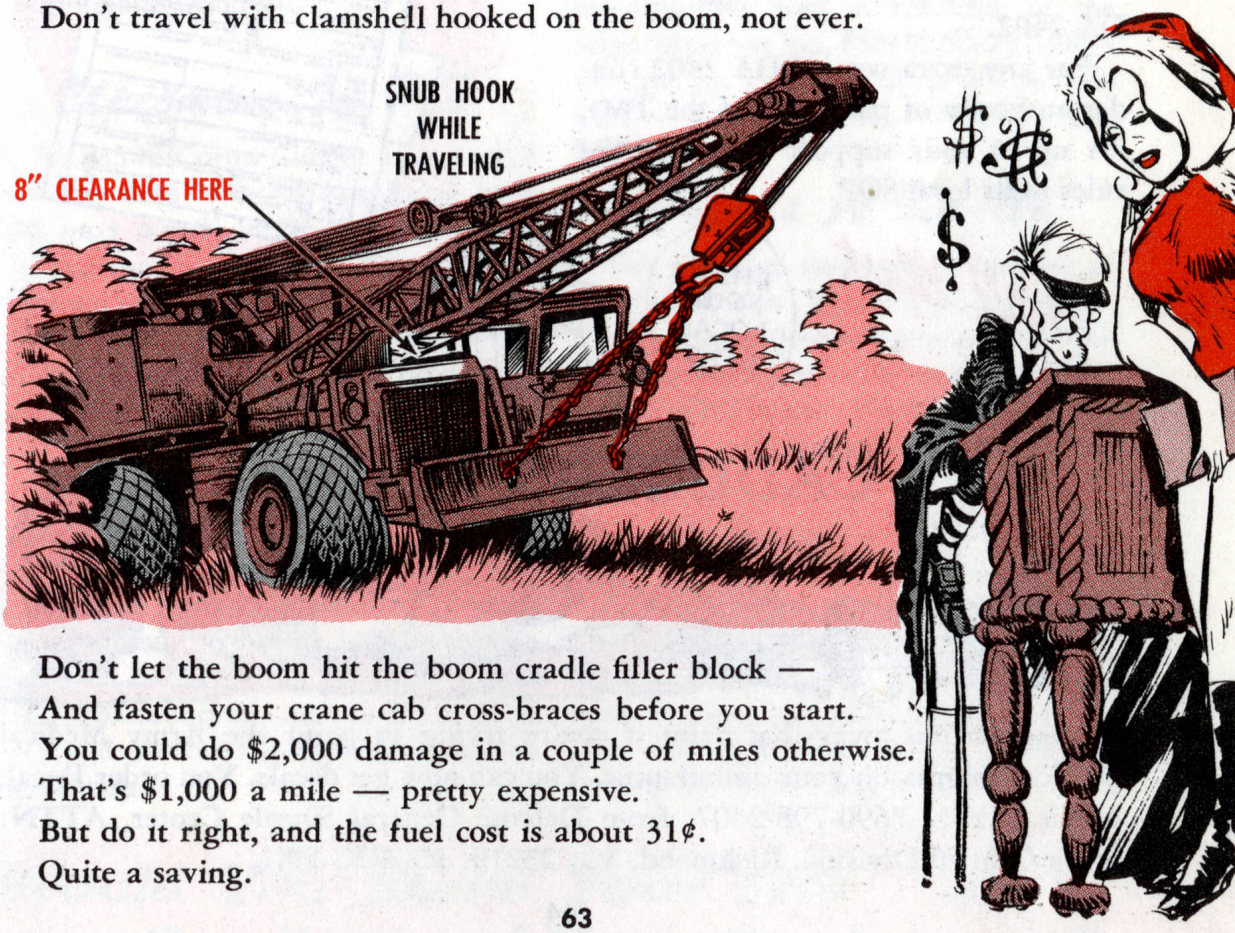
BOOM ROOM...

STOPS CRANE STRAIN



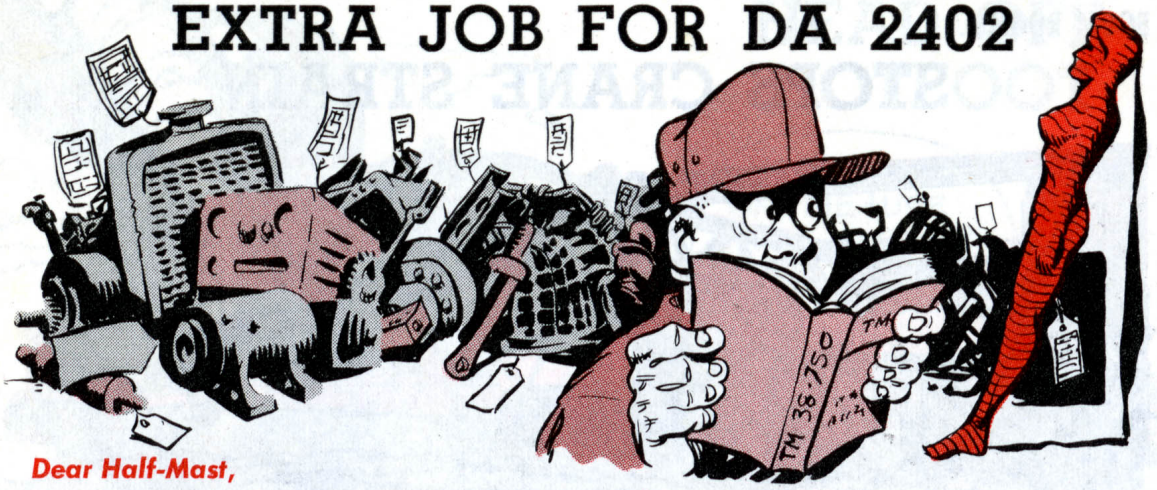
Hey, Rough-Terrain Crane users — listen good — when you gotta go, remember —

Bent booms wreck more 2380's than everything else put together —
But you can beat the boom bam . . . this way:
Use your overpack tow chain to snub the hook to each dozer blade eye.
Then carry the boom 8 inches above the cradle bottom to travel.
Besides that —
Don't travel with clamshell hooked on the boom, not ever.



Don't let the boom hit the boom cradle filler block —
And fasten your crane cab cross-braces before you start.
You could do $2,000 damage in a couple of miles otherwise.
That's $1,000 a mile — pretty expensive.
But do it right, and the fuel cost is about 31¢.
Quite a saving.

EXTRA JOB FOR DA 2402



Dear Half-Mast,

When we send a DA 2407 to our DS unit, they require that we tag the component or part that's to be repaired or replaced with a DA 2402.

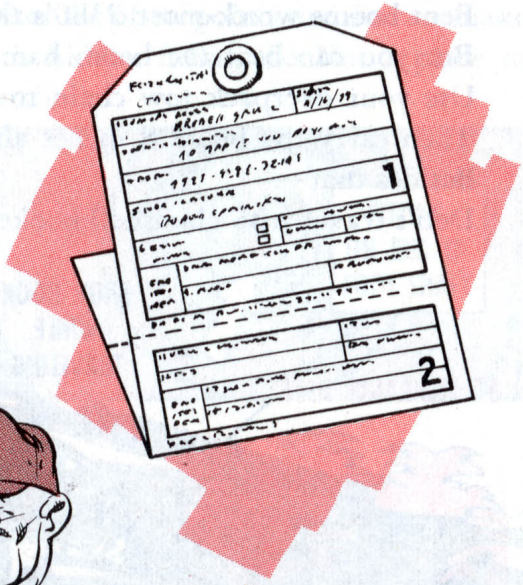
Does TM 38-750 have any guidelines on this use of DA 2402?

SSG C. W. F.

Dear Sergeant C. W. F.,

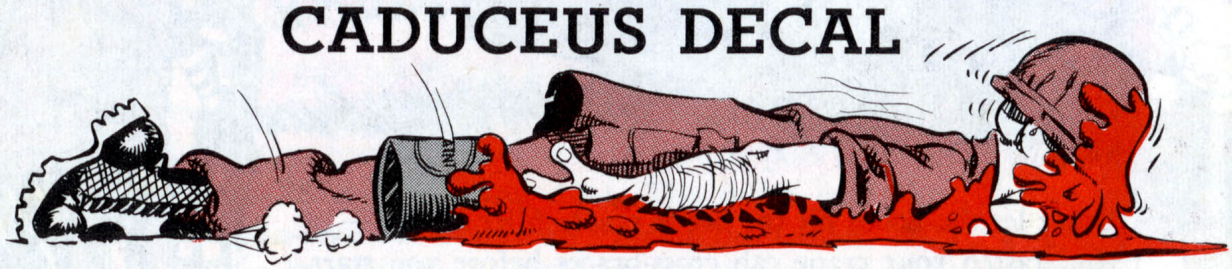
Nope. Only two types of items — direct exchange (DX) and EIR exhibits — are **required** to be tagged with DA 2402.

For any extra uses of DA 2402 (under authority of para 1-7c of the TM), it's up to your support to set up the rules in its local SOP.



Half-Mast

CADUCEUS DECAL



You can put away that paint if you're trying to paint the Army Medical Service insignia on your ambulances. You can now get decals. You order Decal, Medical, FSN 7690-798-2407, from Defense General Supply Center, ATTN: Stock Control Division, Richmond, Va. 23219. It's RIC S9G.

Connie Rodd's BRIEFS

Using Alcohol

Hold one with that item on Page 58 of PS 200 about putting no alcohol in air compressors. An alcohol evaporator is a part of the winterization kit on wheeled vehicles in cold areas; it helps keep air lines and air reservoirs free of ice. So, if you have the alcohol evaporator on your truck, you use alcohol in it. Never put alcohol directly into your truck's compressor, though, nor in your other compressors. Danger!

Upcoming In PS

The M548 Cargo Carrier your baby? Make a date with PS Magazine Issue 206 next month — it's got the scoop. For you supply types, PS 206 will have umpteen pages on the IN's and OUT's of DA Form 2765, as well as the cool word on UND's and IPD's . . . and other stuff like that.

No Substitute

Fill the cylinder on your Huey and HueyCobra ground handling wheels with genuine, petroleum base hydraulic fluid, MIL-H-5606. NEVER use synthetic base lubricating oil, such as MIL-L-7808 — it will eat out the seals and sideline the wheels.

Pull PM, Jack!

Believe it or not, there're important PM services aircraft types should pull on the B-5 tripod hydraulic jack, FSN 1730-516-2018. The new TM 55-1730-202-15 (3 Jul 69) has the scoop on the 5-ton capacity job.

Get The Genuine

If your Huey (UH-ID, H) is authorized a smoke generator subsystem, never use an alternate fluid in the tank or she might blow her top. FSN 9150-261-7894 will get you a 55-gal drum of the right stuff — Fog Oil, MIL-F-12070, Type SGF2.

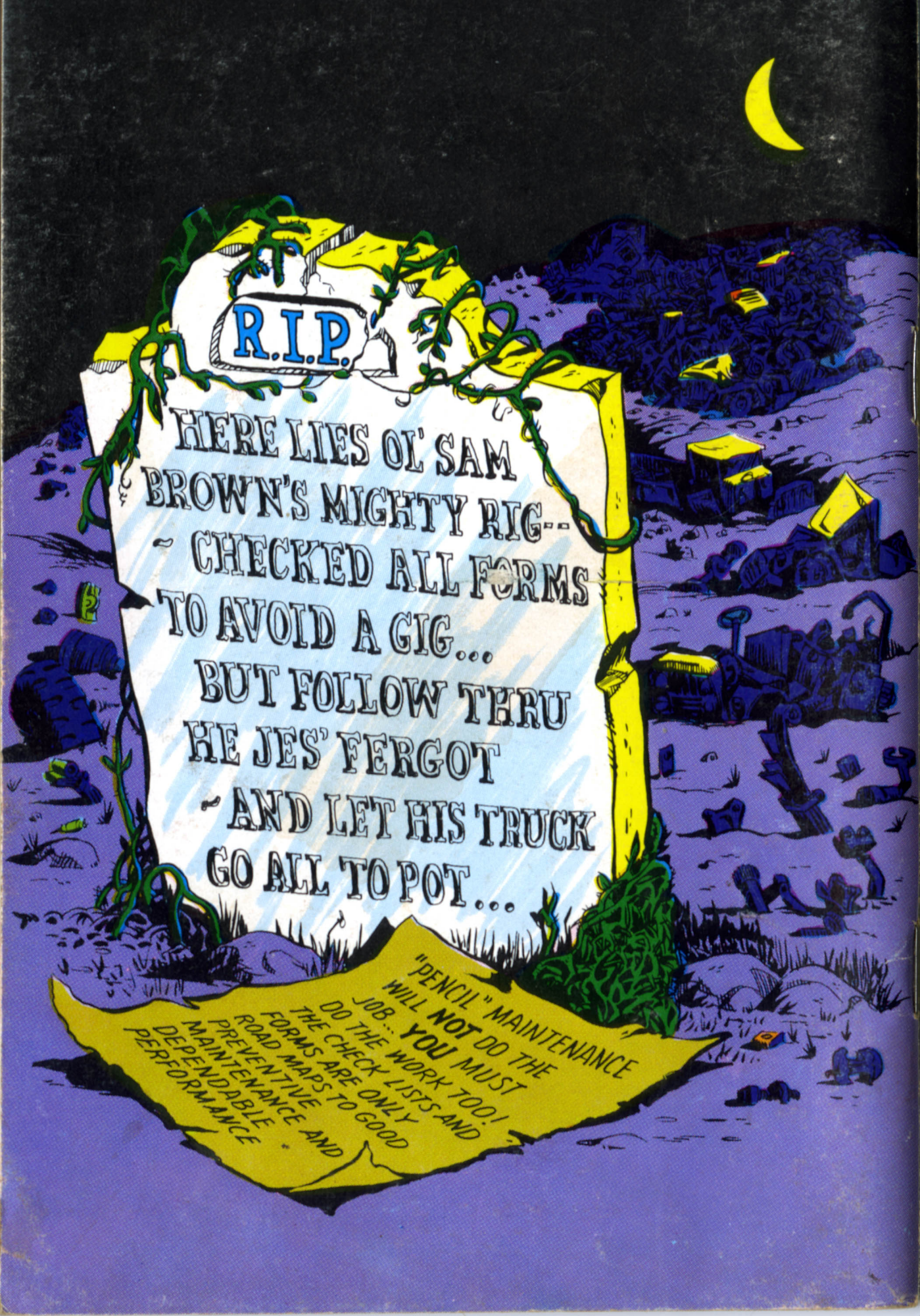
Paint's A No-No

This painting, stamping or burning of small arms wood stocks is strictly no-go. It takes too much sanding to wipe out the old unit markings when that weapon's turned in for repair. Stick to tape — any color — and replace it as often as necessary.

Operator's SOP

Be sure you read and heed TB 385-101 (Jun 69), if you operate a crane, crane-shovel, dragline or similar equipment. It gives you safety and guidance info for operating your equipment around energized power lines.

Would You Stake Your Life *right now* on the Condition of Your Equipment?


R.I.P.
HERE LIES OL' SAM
BROWN'S MIGHTY RIG--
- CHECKED ALL FORMS
TO AVOID A GIG...
BUT FOLLOW THRU
HE JES' FERGOT
- AND LET HIS TRUCK
GO ALL TO POT...
"PENCIL" MAINTENANCE
WILL NOT DO THE
JOB... YOU MUST
DO THE WORK TOO!
THE CHECK LISTS AND
FORMS ARE ONLY
ROAD MAPS TO GOOD
PREVENTIVE
MAINTENANCE AND
DEPENDABLE
PERFORMANCE